THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
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SUPPLEMENT 140

1942 DISEASE INFORMATION FOR THE MIDDLE ATLANTIC STATES

Compiled by

MIDDLE ATLANTIC STATES SECTION
AMERICAN PHYTOPATHOLOGICAL SOCIETY WAR EMERGENCY COMMITTEE

R. S. Kirby, Chairman
Middle Atlantic States Section

March 1, 1943

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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This information was assembled to supply plant pathological workers with facts that are valuable in planning future programs. The crop committee chairman selected the most important diseases from the war standpoint. Each worker was asked to add other important diseases in his own State. The response was prompt and generous and all credit should go to the individual contributors.

R. S. Kirby

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CEREAL CROPS

BARLEY (**winter**) BLACK LOOSE SMUT (Ustilago nigra)

WEST VIRGINIA: Losses due to black loose smut of barley were perhaps a little less than those due to brown loose smut because some seed is treated with New Improved Ceresan for the control of this disease. Control -- Dust seed with New Improved Ceresan at the rate of 1/2 oz. per bu. Perhaps this would be more effective if an adequate certified seed program were developed and all certified seed treated before being sold. (E. J. Wellhausen)

BARLEY (winter) BROWN LOOSE SMUT (Ustilago nuda)

WEST VIRGINIA: Brown loose smut of winter barley caused about the same amount of damage as loose smut of wheat this year, namely, about 3 to 4%. Very little, if any, barley seed planted in West Virginia has been treated with hot water for loose smut control. Control -- Hot water treatment of foundation seed for certified seed growers. Are urging farmers to buy certified seed only one generation removed from treated seed. (E. J. Wellhausen)

CORN BACTERIAL WILT (Bacterium stewartii)

MARYLAND: Stewart's disease is very common on sweet corn but has not caused any great loss to field corn in Maryland until the 1942 season, when it was very destructive in many fields in early August, causing considerable loss in yield of corn and fodder. Many fields were harvested 2 weeks early in order to save the leaves for feed, at a considerable loss in shrivelled, light, loose grain on a spongy cob. Bacterial leaf blight increased susceptibility to Diplodia stalk rot, which caused considerable corn to break over before harvest. Microscopic examination of bacterial lesions on leaves often showed oozing bacteria and Helminthosporium spores in the same lesion. Estimated loss: 6 to 8% in early-planted corn; 2 to 3% in late-planted corn. However, Helminthosporium leaf blight soon overran and covered up the bacterial lesions. Control -- Plant field corn a week to 10 days later than usual. (E. A. Walker)

PENNSYLVANIA: Very little seen on field corn. (R. S. Kirby)

WEST VIRGINIA: Bacterial wilt seemed to be more prevalent this year, causing more damage on susceptible varieties of early sweet corn in home gardens than last year. No damage was noticed on field corn. Certain fields, however, may have been infected but escaped notice because of Helminthosporium leaf blight. The amount of damage to sweet corn in home gardens and commercial fields is difficult to estimate. It wasn't serious, however, because many of the home gardeners and commercial growers are now using resistant hybrids. In the sweet corn breeding nursery at Morgantown more bacterial wilt was prevalent on susceptible lines but no serious

damage resulted. Control -- Resistant varieties. Resistant varieties of sweet corn are now generally available, and many of the field corn hybrids have also been shown to be resistant. (E. J. Wellhausen)

CORN EAR ROTS (Diplodia and Fusarium)

MARYLAND: Ear rots were more serious than in 1941. Diplodia ear rot was about 5 times more prevalent than Fusarium ear rot. About 75% of the Diplodia ear rot was butt rot. Diplodia stalk rot was very abundant especially where preceded by Stewart's disease. From the result of 5 trial plots of field corn, 4 open-pollinated varieties averaged 5.9% ear rots, and 13 hybrids averaged 2.2% moldy ears. The loss for the State was higher in hybrid corn than shown by the results of the plots. Where the percentage of ear rots was between 0.5 and 1.5, the average yield of corn was 68.7 bu. per acre; between 1.6 and 2.5%, 61.3 bu.; between 2.6 and 3.5%, 59.3 bu.; and between 4.5 and 5.5% it was only 56.1 bu. per acre. Estimated loss -- About 8 to 10% on open-pollinated and 4 to 5% on hybrid corn varieties; Control -- Results during past season show that long-season hybrid corn had less ear rot than shorter-season corn. (E. A. Walker)

CORN LEAF BLIGHT (Helminthosporium turcicum)

MARYLAND: The most severe outbreak of this disease ever observed in the State occurred in 1942. Hybrid and open-pollinated corn were equally affected. It was most destructive in the Monocacy Valley and the northern piedmont section; but was observed in the entire State. The disease appeared in destructive amount at the end of August and fields looked as though fire or frost had scorched the leaves. Leaves used for dry feed were made worthless. Early-planted corn appeared to be worst affected although late-planted corn suffered considerably. The disease was more severe in bottom land with poor drainage.

Grain Yields and Damage from Leaf blight on Corn Hybrids and Varieties at Five Locations in Maryland

Varieties and hybrids	Yield per acre Bu.	Leaf area blighted* %
	Short Season	
Lancaster Sure Crop	49.9	38.7
Iowa 939	59.2	38.8
Pioneer 314	55.5	35.9
Ohio W-17	53.6	41.3
Average for hybrids:	56.1	38.7

* Some bacterial wilt may have been included.

Varieties and hybrids	Yield per acre Bu.	Leaf area blighted* %
	Medium Season	
Golden Queen	62.4	24.9
Pioneer 300	56.1	49.9
Pioneer 332	61.4	48.6
U. S. 13	63.7	38.0
Funk G-94	62.1	39.1
Iowealth 29-A	61.0	30.7
Average for hybrids:	60.9	41.3
	Late Season	
Reid Yellow Dent	55.3	27.6
Johnson County White	59.0	20.9
Illinois 448	67.8	22.8
Illinois 784	65.9	23.5
Funk G-135	66.3	22.8
U. S. 99	72.7	20.1
U. S. 262	70.0	30.2
Average for hybrids:	68.5	23.9

* Some bacterial wilt may have been included.

From the 5 trials summarized in the table varieties having from 20 to 30% of leaf area affected had a yield of 64.2 bu. per acre; from 30 to 40% infection 61.9 bu.; and from 40 to 50% infection 57 bu.

Estimated loss -- By harvest time 75% of corn in State had badly blighted leaves. Loss of about 10% in weight of grain and 25% loss of leaf for feed.

Control -- Later planting of corn. Avoid planting corn in low land with poor air drainage. Use more of varieties showing resistance in above table. (E. A. Walker)

NEW JERSEY: Leaf blight caused more defoliation late in 1942 than we have ever before observed in New Jersey. A few fields of late-planted corn in the more humid South Jersey areas blighted so severely that they appeared to have been killed by frost. A wet period accompanied by high humidity made conditions so favorable for the disease that young corn was almost totally defoliated in some instances. No efforts have been made to control the blight as its rare occurrence up to the present time has not warranted such action. (C. M. Haenseler)

PENNSYLVANIA: We had the most destructive outbreak of this disease on record. It was most severe in the southeastern and south-central parts of the State and least destructive in the western part. The disease appeared in July about tasseling time and by late August a few severely affected fields were nearly dead. The average loss for the State was about 12%. In 4 trials in Lancaster County, 4 varieties having less than 20% of leaf area infected had an average yield of 83.3 bu.; 16 varieties with 20 to 30% infection 77.8 bu.; 12 varieties with 31 to 40%, 75.6 bu.; 15 varieties with 41 to 53% infection 73.1 bu.

Control -- Rotation, clean seed, and resistant varieties will be recommended for 1943. Varietal susceptibility was determined in 23 scattered demonstrations. One-fourth of the hybrid varieties had less leaf blight than the average for all open-pollinated varieties and 3/4 had more blight. The average percentage of leaf area infected on different varieties and hybrids in given in the following list:

Percentage of leaf area infected by leaf blight on corn varieties and hybrids in Pennsylvania

Variety or hybrid	Leaf area infected %	Variety or hybrid	Leaf area infected %
Late maturing			
Golden Queen	9	Funk G-63	36
De Kalb 899	11	Ohio C-90	36
Funk G-135	14	Illinois 784	37
Ohio L-98	17	Pioneer 319	38
Lancaster Sure Crop	18	Ohio C-92	38
Ohio C-38	20	Pfister 164	40
U. S. 13	21	Pfister 4897	40
Eastern Seaboard 129	22	De Kalb 639	40
Funk G-80	23	Pfister 360-A	40
Ohio C-96	23	Pfister 189-Q	40
U. S. 13 Penn Hybrid	23	Pfister 380	40
Iowealth 29-A	23	Great Eastern 601	40
Pioneer 340	23	De Kalb 817-A	43
Pfister 260	24	De Kalb 827	43
Funk G-125	25	Pioneer 300	44
Ohio L-94	26	Funk G-37	45
Funk G-94	26	Pioneer 332	45
Pfister 1863	26	Pioneer 336	45
Chio C-82	27	Pioneer 333	46
Bucknell 31	28	Pioneer 317	46
De Kalb 840	30	Pioneer 334	46
Funk G-169	32	De Kalb 628-A	47
Pfister 160	34	U. S. 44	50
Chio C-88	35	Pfister 360	53
Iowealth 25	35	Indiana 608	58

Variety or hybrid	Leaf area infected %	Variety or hybrid	Leaf area infected %
	Medium maturing		
Iowa 939	15	Iowa 459	32
Leaming-Pennsylvania	16	Ohio M-34	32
Ohio W-30	17	Funk G-12	34
Ohio K-35	18	Funk G-15	36
Leaming-Clinton	23	Pioneer 322	40
Funk G-114	25	Ohio W-56	41
De Kalb 404-A	27	Funk G-55	42
Ohio K-24	29	Pioneer 324	42
Ohio W-17	29	Leaming-Ohio	46
	Early maturing		
Ohio K-23	23	Funk G-5	50
Pioneer 353	25	Wisconsin 404	50
Ohio M-15	26	Minnesota 700	50
Clarage	32	Minnesota 800	52
De Kalb 240	36	Wisconsin 275	60
Funk G-4	40	Pioneer 373	69
Ohio M-20	42	Wisconsin 240	75.

(R. S. Kirby)

WEST VIRGINIA: Leaf blight was very severe throughout most of the State, perhaps much more severe than in any previous year. Much of the corn acreage is now planted to hybrids, namely, Ohio W-17, Iowa 939, U. S. 65, and U. S. 13. Probably more Ohio W-17 is grown than all the other hybrids put together. Of these, Ohio W-17 is the most susceptible to blight and Iowa 939 the most resistant. Most open-pollinated varieties seemed to be intermediate between Ohio W-17 and Iowa 939 in susceptibility.

Blight was most noticeable in the eastern panhandle section of West Virginia, primarily in Jefferson and Berkeley Counties. It began to appear in this section early in August and spread very rapidly. Its early appearance and rapid spread was probably due to the fact that most of the corn grown in this area was Ohio hybrid W-17. This hybrid is usually fairly ripe by September 1 in this section and much earlier than the later open-pollinated varieties formerly grown or later hybrids that could be grown. It seems that blight does not readily take hold until the plants reach a certain stage of maturity. Early hybrids seem to show it first or early plantings often show more blight than late plantings of the same hybrid in the same area.

In general, for the State as a whole blight was most outstanding in the longer-season areas where the tendency has been to grow hybrids a little too early for the season. In the shorter-season areas at the higher

altitudes blight was prevalent but much less outstanding. Susceptible hybrids often showed relatively little blight when grown at the higher elevations. Again the earlier plantings at the higher altitudes seemed to be the first to show blight, whereas later plantings in the same vicinity often showed little leaf damage. For the State as a whole blight probably caused little or no reduction in yield of grain. It did, however, reduce the value of the fodder considerably. Most of the corn was pretty well along before it was severely hit. Yields of Ohio W-17 and Iowa 939 have been compared throughout the State for the past 5 years. As an average of 36 trials in different areas of the State prior to this year when blight was not much of a factor, Iowa 939 out-yielded Ohio W-17 by 2.5 bu. per acre. This year with a severe epidemic of blight the resistant hybrid Iowa 939 was compared to Ohio W-17 in 11 different trials throughout the State. The average difference between the 2 hybrids was the same as in previous years; namely, 2.5 bu. per acre in favor of Iowa 939. This does not indicate much damage to Ohio W-17 in grain yields. Even in the eastern panhandle where blight seemed particularly severe, indications are that it caused no appreciable reduction in grain yields. No direct comparisons between Iowa 939 and Ohio W-17 can be made in the eastern panhandle section since Iowa 939 was included in only a few trials in this section. However, a direct comparison between Ohio W-17 and U. S. 13, a later hybrid, can be made. Prior to this year U. S. 13 outyielded Ohio W-17 by 24% as an average of 5 trials in Jefferson county. This year with severe blight on Ohio W-17 and only a moderate amount on U. S. 13, the latter outyielded Ohio W-17 by 22% as an average of 5 trials in Jefferson county, indicating no greater difference between these hybrids than in previous years.

Control -- Since most of the hybrid corn grown in West Virginia is Ohio W-17 many farmers have obtained the idea that hybrid corn is more susceptible to blight than open-pollinated varieties. This, of course, is not true. Other hybrids equally well adapted to West Virginia and more resistant to blight are recommended. In the long-season areas Ohio W-17 could be replaced by U. S. 13, a later hybrid, intermediate in its resistance to blight and a much higher yielder on most soils. In the shorter-season areas, Iowa 939, a highly resistant hybrid and equally well adapted, could be used. (E. J. Wellhausen)

CAT CROWN RUST (Puccinia coronata)

PENNSYLVANIA: Crown rust was the most severe that I have ever seen on late-planted oats in this State. Several fields of late-planted oats in the northern part had 100% infection. Early maturing varieties escaped severe injury. The aecial stage was observed on buckthorn and the red stage on oats in June. The average State loss was about 2%. Control -- Eradication of buckthorn and use of resistant varieties. (R. S. Kirby)

WEST VIRGINIA: Crown rust seemed to be very prevalent causing about 2% damage for the State as a whole. Varieties recommended at present are susceptible but so far have outyielded the more resistant varieties -- even in years such as this one when crown rust was severe. Control -- Eradication of buckthorn; resistant varieties. (E. J. Wellhausen)

OAT LOOSE SMUT (Ustilago avenae) and COVERED SMUT (Ustilago kolleri)

MARYLAND: Considerable oat smut was present in the oat-growing section which is limited to Western Maryland. Loss was less this year than during the past 5-year period. Loss -- about 3% for the State. Control -- Use of New Improved Ceresan dust. (E. A. Walker)

NEW JERSEY: Most fields show approximately 5% infected heads. Only a small percentage of the seed is treated except that grown for certification. (C. M. Haenseler)

PENNSYLVANIA: There was slightly less smut than usual. The 1942 loss was about 10% as compared to the 10-year average loss of 11.4%. Control -- About half of the oats planted are treated. In sections where oats are grown alone dry formaldehyde treatment leads. In areas where oats and barley or wheat are grown in rotations, New Improved Ceresan is most commonly used. Both treatments are effective. (R. S. Kirby)

WEST VIRGINIA: The average loss due to loose smut of oats this year is estimated at 3%. As with some of the other cereals very little oat seed is treated for loose smut. Control -- Dust seed with New Improved Ceresan at the rate of 1/2 oz. per bu. This can best be done through the development of an adequate certified seed program in which all seed is treated before being sold to growers. (E. J. Wellhausen)

OAT STEM RUST (Puccinia graminis avenae)

NEW JERSEY: No observations were made which would indicate that appreciable losses occurred. (C. M. Haenseler)

PENNSYLVANIA: Stem rust on oats in 1942 was first observed on July 16. This disease did not reduce the crop yield more than a trace. As in the case of wheat, the destruction of more than 13,000,000 rust-susceptible barberries in the last seven years has had its effect in reducing stem rust losses. This was especially noticeable in the northeastern and northwestern sections of the State where oats were damaged extensively year after year prior to the removal of the barberry bushes. In these local areas where the barberries have been destroyed, grain producers report crop yields and quality comparable with the best in the State. Control of stem rust on oats is, of course, the same as that for the disease on wheat. These measures include the eradication of rust-spreading barberries, the planting of approved varieties of grain that are resistant to stem rust, and the application of approved cultural practices to produce an early maturing crop. (Donald J. Fitchett)

WHEAT LEAF RUST (Puccinia rubigo-vera tritici)

MARYLAND: Leaf rust was severe in all wheat-growing areas and killed leaves before the crop was fully ripe, resulting in many immature kernels and loss in weight. Some additional loss was encountered from

sprouting of wheat in shock following a prolonged period of rain during the early part of August. Estimated loss -- About 10% reduction in weight of threshed grain. Control -- Development of resistant varieties. (E. A. Walker)

NEW JERSEY: Leaf rust was very prevalent in 1942, somewhat more so than in 1941, according to some observers, and about the same according to others. No careful survey was made. (C. M. Haenseler)

PENNSYLVANIA: This year there developed the heaviest and most destructive outbreak of leaf rust occurring for many years. The rust appeared early in the season and many fields were red with rust by blooming time. Most of the leaves were killed prematurely and the grain was small and shrivelled. The average weight per bushel of wheat in 1942 was 15 to 33% below normal. The rust was severe in all parts of the State. It was first observed May 13. The estimated loss was 20 to 25%. Control -- Little difference between varieties was observed. Thorne wheat seemed to have slightly less leaf rust than other commonly grown varieties. If in the future other wet seasons occur as favorable to leaf rust as this, resistant varieties will be needed. (R. S. Kirby)

WEST VIRGINIA: Leaf rust showed up rather late this year, on the whole causing little apparent reduction in yields. Some fields were more severely damaged than others, but on the average it is doubtful whether it caused more than 1% damage. Control -- All varieties now grown are susceptible. If it gets much worse, resistant varieties may have to be introduced. (E. J. Wellhausen)

WHEAT LOOSE SMUT (Ustilago tritici)

PENNSYLVANIA: Loose smut causes about 3% loss in susceptible varieties like Pennsylvania 44 and Red Rock but less than 1% in the more resistant varieties such as Leap and Forward. Control -- The establishment of disease-free seed sources for susceptible varieties is the most effective control of smut. In such seed sources the stock seed is treated each year with hot water, then dipped in a Semesan solution. Seed sold to other growers is usually one crop removed from hot water treatment and develops only a trace of loose smut. In the largest seed source in the State, it required some 5 years or 5 treatings and the isolation of stock fields to reduce loose smut to a trace in crops 2 years from hot water seed treatment. (R. S. Kirby)

WEST VIRGINIA: Loose smut of wheat again caused considerable damage this year. The average losses are estimated as 3 to 4%. Losses due to loose smuts tend to average 3 to 4% every year, some fields running as high as 30%. This is primarily due to the fact that very little seed planted in West Virginia is treated. Most farmers grow only a few acres and apparently do not consider treating worth the bother. Control -- Perhaps the most effective way of controlling loose smut of wheat is through hot water treatment of foundation seed for certified seed growers

and urging all farmers to buy seed only one generation removed from certified seed. (E. J. Wellhausen)

WHEAT STEM RUST (Puccinia graminis tritici)

MARYLAND: Stem rust was abundant in Maryland, but developed so late that it caused no appreciable loss to the growers. (E. A. Walker)

NEW JERSEY: No evidence is available which would indicate that appreciable losses occur. (C. M. Haenseler)

PENNSYLVANIA: Stem rust on wheat was first noted on June 4, 1942, in York County. There were no extensive outbreaks of this disease in any area, and the stem rust damage to this crop did not exceed a trace. This is in direct contrast to the picture prior to the time barberries were removed in the wheat growing areas of south central Pennsylvania. Before barberry eradication was started in the Cumberland Valley, for instance, severe damage occurred season after season, but since that time these areas have been free from stem rust loss. Control of stem rust in Pennsylvania depends on the continued suppression of the rust-susceptible barberry, the use of approved varieties of wheat that are resistant to the disease as they become available, the planting of early maturing varieties and the use of cultural practices that result in an early maturing crop. (Donald J. Fitchett)

WEST VIRGINIA: Black stem rust was quite destructive in certain areas of the State this year. It was most severe in the southwestern part where damage ran as high as 30% in some wheat fields. The damage for this area as a whole was estimated at 7%. In the eastern panhandle section the damage was somewhat less severe, being estimated as 3% for the area as a whole. The estimated damage for the entire State was 5%. Control -- The adapted varieties recommended are susceptible. The most practicable method of control seems to be the eradication of barberries. Considerable progress is being made in the principal wheat-growing areas of the State. (E. J. Wellhausen)

WHEAT AND BARLEY SCAB (Gibberella zeae)

MARYLAND: Loss from this disease is generally more than is regularly estimated. Rotation in Maryland with wheat or barley following corn results in increased scab development. Estimated loss -- Barley 1% and wheat 3%. Control -- No satisfactory control recommended. (E. A. Walker)

WEST VIRGINIA: Scab was perhaps the most destructive disease on wheat and barley this year. Some fields of wheat were damaged as much as 50%. The average loss for the State as a whole is estimated at 8 to 10%. Control -- Inasmuch as the practice of following corn with wheat or barley without plowing is universal, and cannot readily be changed, there is no adequate means of controlling this disease in West Virginia. Farmers are urged to cut their corn low, double-disk, covering up as much trash as possible and cleaning up the shock rows when fodder is removed. (E. J. Wellhausen)

FORAGE CROPS

KENTUCKY BLUEGRASS STRIPE SMUT (Ustilago striaeformis)

PENNSYLVANIA: Widespread and often severe stripe smut infection was found in Kentucky bluegrass pastures examined during different seasons in 1941 and 1942. Critical examination of 200 sod plugs 1-3/4 inches in diameter removed from each of 13 widely separated pastures revealed that 2 to 25% of the plugs contained smutted plants. Parts of some pastures yielded more than 35% smutted plugs. Of 75 different pastures examined during the past 2 years, none was found free of the disease. The organism is a systemic parasite and infected plants remain stunted and fail to yield forage comparable to that produced by healthy plants. No measures of control are known to be effective, but it is suggested that less injury to diseased plants may result if close grazing is avoided during the summer periods unfavorable for growth of the grass. (K. W. Kreitlow)

SUDAN GRASS, ALFALFA, AND RED CLOVER - DAMPING-OFF

PENNSYLVANIA: Results of nursery tests conducted at different times during the growing season indicate that seed treatment of some grasses and legumes may be beneficial under a wide range of conditions at time of planting. Preliminary experiments showed that Sudan grass averaged 12% increase in stand when seeds were treated with Spergon or Semesan. Stands of alfalfa were increased 5 to 17% when the seeds were dusted with Yellow Cuprocide, Spergon, or DuBay 1205FF. An average increase in stand of 9% resulted when seeds of red clover were treated with DuBay 1205FF. Tests conducted with orchard grass and Kentucky bluegrass showed no increase in stand when treated seeds were planted. (K. W. Kreitlow)

FRUIT

APPLE BITTER ROT (Glomerella cingulata)

DELAWARE: Bitter rot was a less serious problem than in former years. Infections are usually first noticeable 50 to 60 days after petal fall, but in 1942 the first lesions were not observed until 73 days after petal fall. The disease spread rapidly during August, however, and caused considerable damage in some plantings of certain varieties. Fortunately susceptible varieties are not grown in great number in Delaware. Failure to control bitter rot was shown by analysis to be due to low residues of copper. For susceptible varieties Bordeaux mixture 4-4-100 applied from the 4th or 5th cover spray on as long as needed gave excellent control when spraying was thorough. Lower concentrations give satisfactory control on less susceptible varieties. (S. L. Hopperstead)

MARYLAND: Bitter rot makes its appearance each year about 4 weeks after petal fall in the Costal Plain area where it is favored by warm wet climate. It was not as severe this year as usual in commercial plantings. Applications of stronger Bordeaux mixture spray beginning with

the 2nd cover reduces this disease to a minimum. Unsprayed trees are usually severely affected and only a small amount of disease-free fruit is harvested. Smokehouse, Greenings, and Gano are the most susceptible varieties. Estimated loss -- About 0.5% for the State and 2% for the Costal Plain area. Control -- Increase Bordeaux mixture to 4-6-100 or 6-8-100 depending on the variety. (E. A. Walker)

NEW JERSEY: Bitter rot is of minor economic importance in New Jersey. In seasons when the weather is particularly warm and humid during the ripening period, it becomes a problem on such little-grown varieties as Rhode Island Greening, Winter Banana, and Twenty Ounce. One grower who picks his McIntosh apples and then places them on straw mulch under the trees and leaves them there for a week or two to color up, oftentimes experiences bitter rot during this coloring period. Control -- Spray susceptible varieties with a 5-10-100 Bordeaux mixture applied at 10-day intervals, beginning with the appearance of the disease. (R. H. Daines)

PENNSYLVANIA: Bitter rot is seldom serious except in Southeastern Pennsylvania. The average loss in this section for the past 10 years was: In orchards sprayed as recommended .047%, in partly sprayed orchards .476%, and in unsprayed orchards .303%. In 1942 the loss was very nearly the average for the 10 years. Control -- Only a few varieties such as Polly, Smokehouse, and Winter Banana usually have serious loss. Removal of mummied fruit and spraying with 4-8-100 Bordeaux in 3rd and 4th cover sprays are effective controls. (R. S. Kirby)

VIRGINIA: This disease has been of localized importance in Virginia. Outbreaks have most frequently developed in Yellow Newtown and Grimes Golden plantings, spreading from these to less susceptible varieties. The disease has not been troublesome where no highly susceptible varieties were present. Severe losses were incurred in many plantings in central and southern Virginia in 1942. Control -- Bordeaux of not less than 4-8-100 in the 4th and later cover sprays is necessary for the control of this disease. Mummy removal is necessary and recommended where they have been allowed to develop. (A. B. Groves)

WEST VIRGINIA: Bitter rot was quite severe in the central portion of the State where many blocks of susceptible varieties are poorly sprayed at best. In certain commercial orchards in the eastern panhandle, where sprays were delayed by excessive rainfall, the disease developed on such very susceptible varieties as Summer Rambo and Winter Banana. In such cases further spraying with 4-6-100 Bordeaux resulted in imperfect control of the disease on those varieties, though preventing spread to adjacent, later varieties. (E. C. Sherwood)

APPLE BLACK POX (Helminthosporium papulosum)

NEW JERSEY: A bark necrosis, believed to be black pox has been widespread throughout the central and southern part of the State for at least 20 years. It is unusually common and severe on old Rome plantings and less destructive to Delicious, Jonathan, Transparent and other

varieties. Severely affected trees usually have dead or drying branches or even large limbs. The fruit does not seem to be affected in this area. Control -- The use of boron as a soil treatment has not given relief in experiments that have been in progress for the past 4 years. There seems to be no correlation between spray practices and the occurrence of this disease. (R. H. Daines)

PENNSYLVANIA: Black pox has been destructive for about 5 years, attacking and killing branches and spotting the fruit. The disease this year was the 2nd most severe in 10 years, being exceeded by that of 1938. The disease is widespread in the southeastern part of the State (average of 9.3% unsprayed apples infected), scattered in the northeastern and central parts (trace to 0.4% apples infected) and rather rare in the western part. Black pox is most severe on Red Rome, Grimes Golden, and Smokehouse. Infections on the apples start to appear about September 1 and continue to appear, to and during storage. The loss from black pox is less than 1%. Internal bark necrosis, cause unknown, is found scattered throughout the State on Red Delicious. Control -- Fruit infection from black pox is prevented by having apples covered with Bordeaux 1-5-100 during July and August. Sulphur is not nearly so effective against this disease as is copper. (R. S. Kirby)

VIRGINIA: This disease has not been of sufficient importance in Virginia to justify the recommendation of special control measures. (A. B. Groves)

WEST VIRGINIA: Black pox was not observed in this State in 1942. (A. Berg)

APPLE BLOTCH (Phyllosticta solitaria)

MARYLAND: Blotch was not a serious disease in commercial orchards in 1942. Sprays were adequate in controlling it. Unsprayed trees, principally home orchards, show 10 to 50% blotched. Estimated loss -- about 1.5% for the State. Control -- Regular application of Bordeaux mixture during the cover sprays. (E. A. Walker)

NEW JERSEY: This disease is only occasionally observed on sprayed trees in this area, and then only on the Duchess variety or other varieties near Duchess plantings. (R. H. Daines)

PENNSYLVANIA: Blotch this year was more destructive than in 8 out of 10 years. The 10-year averages are: In orchards sprayed as recommended .03%, in partly sprayed orchards .07%, and in unsprayed orchards 2.5%. Blotch was found on June 26 and caused an average loss of .5%. Control -- On such susceptible varieties as Stark, Smith Cider, McIntosh, and Maiden Blush, Bordeaux 4-8-100 is recommended where twig cankers are present. (R. S. Kirby)

VIRGINIA: This disease is troublesome only on certain varieties, but on these special attention must frequently be given. Susceptible varieties include Northwestern Greening, Duchess, and Golden Delicious. The disease on the latter variety has not appeared altogether typical. Fruit infections usually occur as numerous small lesions surrounded by a conspicuous red halo. Infections other than blotch produce similar small lesions. Isolations have repeatedly confirmed the diagnosis of the disease as blotch. Control -- Blotch has required no special measures other than the use of Bordeaux mixture in the 2nd and later cover spray applications, except where numerous cankers have been allowed to develop. The pruning, trimming, and painting of these cankers has been necessary in such instances, as well as maintaining a good cover of Bordeaux mixture. A copper fungicide is necessary for the control of this disease. (A. B. Groves)

WEST VIRGINIA: Very little blotch was observed in commercial orchards in 1942. Northwestern Greening and Duchess, noticeably susceptible varieties, are grown to a very small extent locally. Most commercial growers of these varieties have, through past experiences, learned to use Bordeaux mixture at the second cover spray. Limited observations indicate that 2-4-100 Bordeaux is much superior to 1/2-2-100 in control of this disease in light infections. (C. F. Taylor)

APPLE FRUIT SPOT (BROOK'S SPOT) (Mycosphaerella pomi)

NEW JERSEY: Fruit spot was unusually common on late-maturing apples where copper sprays were not used in certain cover sprays. Control -- In an experimental block located in South Central Jersey, an average of 87% apples on unsprayed Stayman trees showed fruit spot. Where 3 lbs. of lead and 3 lbs. of lime were used at the 7-, 17-, and 27-day sprays the disease was present on 25% of the fruit. A 1/2-4-100 Bordeaux used with 3 lbs. of lime reduced fruit spot infection to 5.1% of the fruit. Sulfur is ineffective in controlling this disease. However, lead and iron carbamate gave good control. (R. H. Daines)

APPLE FIRE BLIGHT (Erwinia amylovora)

MARYLAND: Severe late outbreak of twig infection came late in June and continued through July following a prolonged rainy period. Blossom infection was very slight. York Imperial, Grimes, Jonathan, and Baldwin showed worst infection. Estimated loss -- About 3% for the State. Control -- Spray at blossoming period with Bordeaux mixture 2-6-100. Remove blighted limbs and burn. (E. A. Walker)

NEW JERSEY: Blossom blight was conspicuous in orchards where the trees were making abundant growth. Control -- Avoid use of too much nitrogen and spray with 2-6-100 Bordeaux during the bloom. (R. H. Daines)

NEW YORK: Fire blight was local and slight throughout the State in 1942 on both apples and pears, being much less serious than in 1941 on apples in the Lake Ontario fruit belt. Control -- The application of

2-6-100 Bordeaux mixture when 3/4 of the flowers are open is included in the apple and pear spray schedules for orchards where fire blight is a problem. The control obtained is often only 50% but even this reduction is worth while. (W. D. Mills)

PENNSYLVANIA: Fire blight was unusually severe throughout the State. For the past 7 years blight has been present in epidemic amounts. This year there was less blossom blight than for several years but twig blight was more severe than for some years. In the southcentral part of the State 25% of the terminals on York and Grimes were infected in some orchards. Blight was first observed on May 15. The average loss in the State was about 2%. Control -- Application of 2-6-100 Bordeaux in bloom has in many cases given commercial control. One large orchard where Bordeaux was applied for several years, has been free of blight. This year only half of this orchard received an application in bloom. Blight was severe where the spray was omitted but almost nonexistent where the spray was applied. (R. S. Kirby)

VIRGINIA: Fire blight was quite severe in Virginia in 1942, occurring principally as a delayed blossom blight. The outbreak might be said to have erupted, it developed so suddenly. There was comparatively little secondary spread. Yorks, Jonathans, Grimes, and Romes were among the most severely blighted, although some plantings of Stayman were also hard hit. Control -- Blossom applications of Bordeaux mixture have been used by some growers and have been tried experimentally. Results have been very spotty however, and the practice is not generally recommended because of severe russeting which frequently develops. Pruning and canker treatments have not been sufficiently beneficial to justify their recommendation to the average grower. In the hands of a trained operator, better results might be anticipated. It is felt that the manner of initial spread of this disease is not well-enough understood to provide a basis for sound effective control measures. (A. B. Groves)

WEST VIRGINIA: Severe outbreaks of fire blight occurred throughout the State. These outbreaks were sporadic even on the most susceptible varieties, and are believed due to the relative abundance of holdover cankers in the general vicinity. Only a limited amount of blossom spraying was done, many growers choosing to assume the risk of severe injury by fire blight rather than suffer possible severe russeting of the fruit. Where the blossom spray was used, the disease appeared to be less prevalent. (E. C. Sherwood)

APPLE RUST (Gymnosporangium juniperi-virginianae)
QUINCE RUST (Gymnosporangium clavipes)

MARYLAND: Cedar rust was not as serious in 1942 as in the previous year on account of a prolonged dry period following blooming. Yorks, Grimes, and Golden Delicious showed more leaf and fruit infections than other commercial varieties in areas planted near cedar trees. Estimated loss -- About 1.5% for the State. Control -- Eradicate redcedar trees

near commercial orchard. (E. A. Walker)

NEW JERSEY: Owing to dry spring weather the incidence of rust infections has been very low in New Jersey orchards during the past 2 years. Apple rust is normally more common than quince rust in this area. Control -- Eradication of redcedar. (R. H. Daines)

NEW YORK: Both apple rust and quince rust were local and very slight in the Hudson Valley in 1942, being much less than in 1941. Hawthorn rust (G. globosum) was local and very slight in both years. Control -- Fermate has been shown in Hudson Valley experiments to be a much more effective fungicide than sulfur against the cedar rusts, although slightly less effective than the better elemental sulfurs in scab control. For the Hudson Valley, where cedar rust is very important and eradication of cedars impractical, our 1943 spray schedule will suggest the use of 1/2 lb. Fermate and 3 lbs. elemental sulfur per 100 gals. in preblossom and bloom sprays, if needed, for the control of both cedar rust and apple scab. (W. D. Mills)

PENNSYLVANIA: Dry weather during and immediately following bloom in the areas where cedar-apple rust is severe reduced rust in 1942 to about 1/3 of the 10-year average. The apple rust is about twice as destructive on fruit as is the quince rust. Counts in over 300 orchards during the past 10 years give the following percentages of rust-infected fruit: in orchards sprayed as recommended, 0.1%, in partly sprayed orchards 0.07%, in unsprayed orchards 0.04%. Control -- Eradication of redcedar. (R. S. Kirby)

VIRGINIA: Apple (cedar) rusts have continued to be a problem in many orchards adjacent to uncut cedar areas, even though redcedars have been cut back for the specified 2 miles. Fruit and leaf infection were severe on York and Jonathan in northern Virginia in 1942. No recommendation of spray practices to supplement the usual cedar cutting program has been made, although their possible merit is being investigated. Quince rust is frequently severe on such varieties as Stayman and Delicious, often going unrecognized because of its occurrence on these varieties which are quite resistant to the common apple rust. Typical lesions appear as dark green areas, usually slightly depressed at the margins and slightly raised in the center. They do not greatly differ from common apple rust lesions except that they are dark green, never orange, and are smooth (do not produce aecia). (A. B. Groves)

WEST VIRGINIA: Loss in the commercial orchard section was slight in 1942. This is attributed chiefly to extensive cedar cutting in 1940-41. (C. F. Taylor)

APPLE SCAB (Venturia inaequalis)

DELAWARE: Apple scab was of little consequence in Delaware during the past season. Although the perithecia were matured and the spores shot during the critical scab periods the rains were of too short duration to allow infection. Unsprayed trees of susceptible varieties had less than 5% infection 20 days after petal fall. (S. L. Hopperstead)

MARYLAND: Scab was not a problem with commercial growers this year, being much less abundant than is present in a normal season. A dry season prevailed during April, May, and June with heavy rainfall during the remaining crop period. Although developing scab perithecia were abundant, ascospores matured late (June 6) and irregularly. Moisture was lacking in which to germinate spores. Even unsprayed home orchards showed less than 10% of the fruit infected. Leaf infection developed late in August. Estimated loss -- About 1% for the State in commercial orchards, 5 to 8% in unsprayed trees of susceptible varieties. Control -- Accurate timing of early sprays with maximum ascospore discharge. Use lime sulfur (1-75) in pre-blossom sprays; wettable sulfur in petal fall and 1st and 2nd cover sprays; and 1/2-2-100 Bordeaux mixture in remaining cover sprays where bitter rot is not a problem. (E. A. Walker)

NEW JERSEY: Because of the relatively dry spring, apple scab was not a serious problem in New Jersey this past growing season. Although the disease was common in unsprayed orchards, it was difficult to find in sprayed blocks. Control -- Lime sulfur or wettable sulfur was used in the pre-blossom sprays, whereas wettable sulfur was used in the petal fall and 7-day applications. (R. H. Daines)

NEW YORK: Apple scab was general and moderate to severe in poorly sprayed orchards throughout the State in 1942. Early in the season scab was general but slight to moderate in amount, but the amount increased during late summer and the injury to fruit was higher than usual. A number of growers as well as our experimental staff obtained excellent control with schedules of elemental sulfur. The practice of dusting or spraying with elemental sulfur during scab rains is increasing rapidly. The sprays and dusts both give excellent control providing they are applied before infection has occurred. The time during which these elemental sulfur applications are effective varies with the prevailing temperature and the presence or absence of abundant, mature perithecia in the orchard. (W. D. Mills)

PENNSYLVANIA: In 44 scattered unsprayed orchards an average of 50.7% of the apples were scabby. This was 23.2% less scab than the average for the 13 preceding years. In only one year, the drought year of 1936, was there less scab. Scab occurrence was variable. In northwestern Pennsylvania where rainfall was above normal in April, May, July and September, a severe outbreak occurred and most unsprayed orchards had 100% infection. In the southwestern, central and northeastern parts with rainfall below normal in April, normal in May, and above normal in June and July, scab was slightly below the 13-year average. In the far southeast little rain fell until the 2nd cover spray and the remainder of the season was abnormally wet. Here only 13% of unsprayed apples were scabby. The average State loss was about 5%. Control -- Fifty-five counties receive spray service. Lime sulfur was recommended in the pre-blossom sprays, wettable sulfur in petal fall and first cover. In the 3rd and 4th cover Bordeaux 1-5-100 was used in eastern and central parts while sulfur was used in northern and western parts of the State. Average amount of scabby apples

in 140 orchards sprayed as recommended was 1.79%. The most important scab sprays were petal fall in northwest (40% scab where omitted), 3rd and 4th covers (6 to 21% scab where omitted, except in south-central 3.1%), delayed dormant and pink sprays in northwest (7% scab where either spray was omitted). (R. S. Kirby)

VIRGINIA: Scab has been of appreciable consequence in Virginia about 1 year in 3; a severe outbreak occurs about 1 year in 5. There was very little scab in Virginia during 1942, owing apparently to delayed maturity of ascospores and low early season rainfall. Very few spores were discharged before the first week of June, at which time high temperatures and adequate fungicidal covering on most varieties served to keep infection at a minimum. Late season or storage scab has been a factor twice during the past 15 years, occurring in seasons in which scab was not controlled in the spring and prolonged rains occurred during late summer or early fall. A 1942 outbreak was probably avoided only because of the lack of early season infection. Control -- Lime sulfur 1-50 is recommended in the pre-blossom and petal fall sprays, and is frequently used in the first cover application. Flotation and wettable sulfurs are also widely used in these applications, as well as in later sprays. The use of Bordeaux 2-4-100 usually begins with the 2nd or 3rd cover but because of the critical copper situation, elemental sulfurs will be recommended through the 2nd cover sprays. Following this only one fungicidal strength Bordeaux spray will be recommended for each series of codling moth brood sprays, and here only on varieties susceptible to scab. Other varieties will receive lead and lime, or lead, lime and wettable sulfur. (A. B. Groves)

WEST VIRGINIA: Apple scab was widespread and severe in the central and southern sections of the State. In the eastern section, where better spray practices are followed, only a trace of loss was caused. In 1942 scab was very late in developing, probably owing to deficient moisture during the winter and to drought conditions during April. The petal-fall spray was the most important control spray. Development during the wet weather of the past summer was prevented by the Bordeaux mixture used as a safener in the lead arsenate sprays. (E. C. Sherwood)

APPLE SCOTY BLOTCH (Gloeodes pomigena) and
FLY SPECK (Leptothyrium pomi)

MARYLAND: These diseases were very common on unsprayed apples. Regular spraying gave perfect commercial control. Heavy rainfall and high humidity accounted for rapid spread of these diseases. Estimated loss -- About 2% for the State. Many unsprayed trees in home orchards had 90% infection. Control -- Spray with light application of Bordeaux mixture (1/2-2-100) in cover sprays. (E. A. Walker)

NEW JERSEY: These diseases caused severe losses in poorly sprayed orchards this past year, but were of no importance where sprays were thoroughly applied. Control -- In an experimental block located in the south-central part of the State, an average of 97% of the apples on unsprayed

trees showed these diseases, whereas only 5.2% was present on trees sprayed with 3lbs. of lead arsenate, and 3 lbs. of lime at the 7-, 17-, 27-day applications. (R. H. Daines)

NEW YORK: Slightly more sooty blotch appeared in 1942 upon apples and the disease was locally severe upon Keiffer pears in the Hudson Valley. Control -- In addition to the cover sprays with their known value in control Dr. Palmiter has obtained some interesting results with certain dormant sprays. These are still in the experimental stage and probably no dormant sprays will be recommended for the control of sooty blotch this coming season. (W. D. Mills)

PENNSYLVANIA: We had the most severe outbreak of these diseases on record. An average of 70.6% of unsprayed apples were infected. This was 37.8% above the average for the 13 preceding years. These diseases were most severe in the southeastern part of the State (98% unsprayed fruit infected) where rainfall during July, August and September was 45% above normal. In the northeast rainfall was 39.5% above normal and 83% of the fruit was infected. In the central part rainfall was 24.2% above normal and 80% of the fruit was infected. In the western part of the State rainfall was 10.7% above normal and 6.6% of the apples were infected. The disease was first observed on July 31. The average State loss was about 4%. Control -- Following the spray schedule as outlined under apple scab held these diseases to 0.2%. The most important sprays for control are best shown in demonstrations in southeastern Pennsylvania where each spray was left off different blocks of trees. All sprays except 1st cover = 3.6% apples infected. All sprays except 3rd cover (mid June) = 14.4% apples infected. All sprays except 4th cover (mid June) = 21.9% apples infected. Bordeaux was observed to be more effective than any form of sulfur in preventing these diseases. (R. S. Kirby)

VIRGINIA: These 2 diseases were more abundant in Virginia during 1942 than for several seasons, apparently because of the abundant late season rainfall. Sooty blotch in particular developed rapidly during the late summer and early fall. Little trouble was experienced where the regular fungicidal applications were made. No special recommendations are made for the control of these 2 diseases as none are felt to be necessary. (A. B. Groves)

WEST VIRGINIA: These diseases were prevalent in the central and southern sections of the State where many home orchards are unsprayed. In the eastern panhandle, where Bordeaux mixture was added to the cover sprays to act as a safener against arsenical injury, control was excellent. It caused little, if any, reduction in grade in sprayed orchards. (E. C. Sherwood)

CHERRY (sour) LEAF SPOT (Coccomyces hiemalis)

NEW JERSEY: Complete defoliation of unsprayed and sulfur-sprayed trees by early in August was common throughout the State. However, where certain copper fungicides were used in the post-harvest applications,

defoliation did not occur until October. The foliage on Bordeaux-sprayed trees showed excessive copper injury. A pronounced yellowing of the foliage followed by a heavy leaf drop occurred on one commercial block following the use of lime sulfur (1-50) during a warm humid period. (R. H. Daines)

NEW YORK: Cherry leaf spot was quite abundant late in the year. For the third successive year schedules of both lime sulfur at 1-40, and 1-1/2-6-100 Bordeaux plus a spreader, dwarfed the size of the cherries in comparison with paste sulfur plus a sticker, and fixed copper plus a sticker. For the 3-year period the total yield on the flotation sulfur sprayed trees has been highly significantly larger than on the trees receiving Bordeaux or lime sulfur. The fixed-copper schedule has given a highly significant increase in yield over Bordeaux and a probably significant increase over the lime sulfur. The trunk girth increase for the 3 years is highly significantly smaller for the trees receiving lime sulfur than with those receiving the other 3 treatments. The control of leaf spot has been superior with the 2 copper schedules but in the worst year over 80% of the leaves were retained in late August and over 60% were retained on October 1 with all treatments.

A split schedule of lime sulfur and bordeaux was reported in Michigan by Dutton in 1923 to cause serious foliage injury in nearly every instance. Complete defoliation to sour sherries by Bordeaux following lime sulfur in 1920 was reported in New York in 1921. I agree with Dutton who said,

"Some growers have preferred to use Bordeaux because of its excellent fungicidal properties, but, because of the dwarfing effect on the fruit, have substituted lime-sulfur for all or part of the applications before harvest and then made the after-harvest application with Bordeaux. Such practice, in 1923, resulted, in nearly every instance, in serious foliage injury. Reports of such injury were received from nearly all cherry growing districts. In experiments at Traverse City, . . . the materials were alternated in various ways; from lime sulfur to Bordeaux and from Bordeaux to lime sulfur. The changes were made at different applications but the result was always the same; severe foliage injury followed, regardless of which way the change was made or at what period it occurred. Such changes have been made in other years without apparent ill-effects but because of the possible serious results which may follow under some conditions, the practice must be considered unsafe."

Our growers have been using flotation paste and shifting to a fixed copper when and if leaf spot appears. So far no visible injury or dwarfing of the cherries has occurred. In one instance in 1940 a shift from lime sulfur to Bordeaux mixture in July caused no visible spray injury but the cherries were so dwarfed that 160 cherries were required to make a pound. Many growers shifted from lime sulfur to fixed copper at the same time and effectively stopped leaf spot without visible injury.

The cherry leaf spot fungus usually matures its spores during the bloom period of sour cherry and ascospores are often discharged before the petal fall stage. However, the leaves are not susceptible to infection until the stomates open at or shortly after the petals fall. Our occasional year of very serious damage by leaf spot usually is initiated by an infection prior to the shuck-fall stage. The Wisconsin data for a long period

seem to indicate the same thing to be true in that State. 1928 was such a season in western New York. Counts made July 5 on Montmorency cherries showed 7% of the leaves showing leaf spot on the trees receiving both the petal fall and shuck sprays. On trees receiving the petal fall and no shuck spray 18% of the leaves were infected while on the trees omitting the petal fall but receiving the shuck spray 47% of the leaves showed leaf spot. The sprays consisted of lime sulfur 1-40 with 2-1/2 lbs. lead arsenate per 100 gals. Such experiences have convinced us that at least in orchards on a sulfur schedule the petal fall spray may not safely be omitted on sour cherry. (W. D. Mills)

PENNSYLVANIA: Cherry leaf spot was abundant in southern Pennsylvania. Unsprayed trees were completely defoliated by the middle of August. It was again demonstrated that 4 applications of lime sulfur will not hold the foliage in a satisfactory manner, whereas 2 applications of lime sulfur followed by 2 of Bordeaux mixture 2-8-100 kept the trees in good foliage until about October 1. The petal fall spray appears to be of little or no value in leaf spot control. Four sprays of Bordeaux or certain other coppers are satisfactory, but because of injuries to fruit, cannot be recommended. A part sulfur, part Bordeaux schedule appears to be the best at present under Pennsylvania conditions. (H. W. Thurston, Jr.)

VIRGINIA: Cherry leaf spot was quite abundant in Virginia last year, although perhaps not so severe as in sections to the north. The initial infection was later than usual, although secondary spread was rapid enough to defoliate unsprayed trees by late summer. Control -- Experience indicates a split schedule of lime sulfur and Bordeaux mixture to be perhaps the best for leaf spot control and production of uninjured fruit. (A. B. Groves)

WEST VIRGINIA: Initial development of the cherry leaf spot fungus was delayed in 1942, in consequence the petal fall spray was of little importance in control. A full schedule of lime sulfur was inadequate in preventing leaf spot. Any schedule which called for the application of at least one copper spray before, and one after harvest provided adequate control of leaf spot. Owing to the occurrence of fruit injury in the copper spray plots, it appears desirable to use a minimum copper schedule next year. In 1943 it is planned to recommend the following spray schedules:

(A) - (If a pre-harvest application is to be made) 3 lime sulfur sprays, followed by a fixed copper at the pre-harvest period, and either fixed copper or Bordeaux mixture at the post-harvest period.

(B) - If no pre-harvest application is planned, it is recommended that 2 sprays of lime sulfur be followed by a fixed copper spray at the three-weeks period and at the post-harvest period. (C. F. Taylor)

PEACH BROWN ROT (Monilinia fructicola)

MARYLAND: Brown rot is our worst peach disease. Dry weather early in the season reduced blossom blight. The disease increased rapidly on

ripening fruit in July and August during the exceedingly wet period. Growers managed to keep foliage and fruit covered between rains so that loss was kept to a minimum. Considerable fruit rotted on vigorous J. H. Hale trees even where the best spraying was done. Sulfur dusting was continued during the ripening period by commercial growers. Application of sulfur to fruit at packing time prolongs the storage life of peaches by keeping down brown rot. Estimated loss -- Loss in commercial orchards about 3.5%; in home and unsprayed orchards 85%. Control -- Dry-mix lime sulfur or wettable sulfur at blossom time and petal fall aids in the control of blossom blight. Frequent applications of wettable sulfur sprays before harvest and of sulfur lime dusts at harvest time effectively control the disease. Some growers pick up all drop peaches after harvest and bury them, thus reducing the inoculum for the next season. (E. A. Walker)

NEW JERSEY: Blossom blight has been less common than usual during the past 2 years, owing, no doubt, to the dry weather we have experienced during the blooming period. This disease spread rapidly in poorly sprayed plantings during the fruit softening period when wet weather was common. In orchards that were thoroughly dusted or sprayed during this period, the losses from brown rot were not great. (R. H. Daines)

NEW YORK: Brown rot apothecia were found in considerable numbers on old mummies of peach and plum in late April but dry weather during bloom prevailed and little blossom blight developed over most of the State. Fruit rot was general but moderate in most areas upon peaches and prunes. Only slight loss was caused on sour and sweet cherries.

Control -- Mr. Fred Lewis of this department has been conducting some experimental work upon the use of Fermate as a bloom spray upon peaches for the control of brown-rot blossom blight. Results were encouraging with no reduction of fruit set when Fermate was applied at 1-1/2 lbs. per 100 gals. in full bloom and with a highly significant reduction in brown rot from 60.9 to 42.5 cankers per tree. These were young trees of the Valiant variety which is very susceptible to brown rot and conditions were very favorable for brown rot infection. Insufficient work was done on blossom applications of Fermate upon sweet cherries to draw conclusions, but upon these self-sterile varieties a reduction of set seemed to result. These are unpublished data of Mr. Lewis but we extension men are constantly using such data with proper precautions.

Some encouraging results with the control of brown rot and of Botrytis rot of sweet cherries by the use of Fermate before harvest were reported at the New York State Horticultural Society in January 1942 by Dr. D. H. Palmiter. Further experimental work this year indicates that an application of Fermate before harvest prolonged, for a week, the period in roadside stands that sweet cherries could be held without rotting. (W. D.Mills)

PENNSYLVANIA: Dry weather early in the season prevented old mummies on the ground from forming apothecia. There was much less blossom blight than occurs most years. A wet season from mid June to harvest enabled brown rot to develop very rapidly. The average State loss was about 15%. This loss was exceeded in only 2 of the last 11 years. The loss in completely sprayed orchards was under 5%. In partly sprayed and unsprayed

orchards the loss was from 5 to 100%. Control -- The late cover and week before harvest spray were the most important in preventing loss. Wettable sulfur sprays were effective. One orchard omitted the last 2 sprays in one block of trees and lost all their crop in this block. In adjoining blocks where the sprays were applied the loss was below 5%. (R. S. Kirby)

VIRGINIA: Blossom blight is normally of little importance in northern Virginia, although occasionally troublesome in the Piedmont area. No blight was observed in 1942 owing no doubt to the dry early season. Fruit losses were above normal, but not of serious proportions in well sprayed plantings. Control -- Wettable sulfurs are recommended and almost universally used. Four applications at approximate 3-week intervals with the first spray beginning in early June have proven adequate. A pre-harvest application of sulfur at from 2 to 3 lbs. per 100 gals. (no lime) is widely used and affords additional protection through the critical harvest period. (A. B. Groves)

WEST VIRGINIA: Brown rot was very severe on early peaches in all parts of the State, the crop being a total loss in some unsprayed orchards. Loss was generally less severe in the later varieties. However, in some local situations delay in applying the 2nd cover allowed the disease to start, mainly on fruits injured by insects or other causes. Prompt attention to the removal of this source of infection followed by sulfur applications, checked the disease and very little actual loss occurred, increased size compensating for the removed fruit. (E. C. Sherwood)

PEACH CANKER (Fusicoccum spp. and Valsa spp.)

NEW JERSEY: Peach canker was less severe in South Jersey during the past 2 years than it was during the 2 or 3 preceding years. The cold weather of the 1941-1942 winter killed many young trees that had been affected with trunk cankers 2 and 3 years earlier. Control -- Experiments in which various kinds of spray materials were applied during the defoliation period and during the blooming period have failed to give control of this disease. The severity of the disease has been greatly decreased in local areas, following the removal and burning of old badly diseased trees, accompanied by careful pruning and destruction of trimmings of the affected younger trees that were not removed. (R. H. Daines)

PEACH VIRUSES

MARYLAND: Peach yellows and little peach are on the decline since the eradication program was inaugurated in 1940 and 1941. These diseases are confined mostly to home orchards and scattered roadside seedlings. Commercial orchards are free or comparatively free of viruses. Estimated loss -- About 0.5% in 1942. Control -- Eradicate and burn trees as soon as they are discovered in the orchards. (E. A. Walker)

NEW JERSEY: Yellows and little peach - One case of yellows and several cases of little peach were observed in New Jersey last summer. All observed cases were located in the central and northern part of the State. Control -- Eradication strongly advised. (R. H. Daines)

PENNSYLVANIA: Yellows - A severe outbreak of yellows occurred in 1941. The disease was most severe in the western part but increase was noticed in all parts of the State. In 1942 there was only about 1/3 the loss of the previous year (3% in 1941 and 1% in 1942). Control -- Eradication is recommended.

X-disease or yellow-red virosis - Infected choke cherries (Prunus virginiana) have only been found in 6 counties in the northwestern part of the State. In 2 of these counties peaches growing near infected choke cherries showed symptoms. (R. S. Kirby)

VIRGINIA: Yellows - The outbreak of yellows which appeared to threaten in 1941 failed to continue developing at the rate apparent a season earlier. Numerous new cases were located, however, and a few formerly disease-free orchards were added to the list of infected plantings. Control -- Eradication is recommended and generally practiced. Nicotine sulfate 1-800 applied at the time of plum leaf hopper hatching was suggested for trial in orchards where many new cases were observed, and a few such applications were made. Their value cannot be estimated at this time.

Yellow-red virosis - This disease has not been observed in Virginia, owing perhaps to the general location of peach plantings, which are quite distant from wild chokecherry thickets. (A. B. Groves)

WEST VIRGINIA: Yellows - This disease was less prevalent in 1942 than in 1941. In 1942 very little yellows developed in commercial orchards. However, many of the trees in home gardens in small villages in the same region showed well-developed symptoms. The disease was more prevalent than in a normal year.

Yellow-red virosis was not found in West Virginia. (C. F. Taylor)

RASPBERRY ANTHRACNOSE (Elsinoë veneta)

MARYLAND: The season was relatively dry this year and anthracnose caused a loss of about 2%. It is a constant factor in production and constitutes an ever-present menace in most plantings. Control -- Removal of "handles" from black raspberry sets as soon after planting as possible. Removal and destruction of heavily infected new canes. Prompt removal and destruction of fruiting canes after harvest. Control of weeds to allow free air circulation; and spraying with the following: 1.--Lime sulfur 1-12 when buds begin to break in spring; 2.--Bordeaux 2-4-50 about 1 week before blooming; 3.--Bordeaux 2-4-50 as soon as blossoming is over and again as soon after harvest as possible. (W. F. Jeffers)

NEW JERSEY: Raspberry anthracnose is of minor importance on Latham and Ranere, our only commercial varieties, except in certain seasons when weather conditions are unusually favorable for the disease. It has been far less prevalent in recent years since spraying has become more generally practiced. The same disease is much more severe on dewberries, where spraying with liquid lime sulfur 1-40 at delayed dormant followed by Bordeaux mixture 6-8-100 at pre-blossom, has given very satisfactory commercial control. Spraying is not commonly practiced on dewberry, however. The same schedule is advised for raspberries and is used by many growers. (C. M. Haenseler and J. H. Clark)

PENNSYLVANIA: This principal fungous disease was found to be Statewide in distribution. It occurred on all black varieties, on the red varieties, Taylor, and on blackberries. The abundant wet weather favored the early development of the fungus which was well established by June 15. This disease caused a loss of about 8%. Control -- The disease did a minimum amount of damage in patches that were sprayed 2 to 3 times with 1-50 liquid lime sulfur. (George L. Zundel)

VIRGINIA: This disease has been perhaps the most troublesome disease of raspberries in Virginia. Late dormant applications of Elgetol 1/2 to 100 have markedly reduced early infection, although cover sprays were necessary to prevent the subsequent development of infections. Both lime sulfur and Bordeaux mixture are used, neither with entire satisfaction as regards both disease control and spray injury. (A. B. Groves)

WEST VIRGINIA: Anthracnose is universally present. Raspberries are grown on a small scale and spraying is not a consistent practice. Current season infection was heavy in the few plantings observed. It was favored by frequent rains. (J. G. Leach)

RASPBERRY VIRUS

MARYLAND: Green and yellow mosaic diseases occurred to some extent in most of the plantings but as usual did not cause more than 2% loss for the State as a whole. Some plantings, in which roguing had not been practiced and where other precautions had not been observed, suffered higher losses.

Severe Streak - Most of the black raspberry plantings in western Maryland contained some severe streak. Affected plants are recognized by the growers and eradicated.

Mild Streak - This is the most serious raspberry disease in Maryland, causing about 8% loss for the State as a whole. As mild streak is very difficult to recognize it is usually spread freely in nursery stock and thus certain plantings were found to have as much as 50% infection. The loss from this disease results from the drying up of fruit before it matures.

Control -- Virus diseases are controlled by planting disease-free stock and by careful roguing. (W. F. Jeffers)

NEW JERSEY: Mosaic is very common in all commercial plantings which are several years old, but where proper cultural practices are followed and the plantings renewed frequently the crop losses due to mosaic are not great. Satisfactory yields can be maintained in the Latham and Ranere, our 2 commercial varieties, where plantings are made with mosaic-free stock, the new planting isolated from old diseased fields, the young field rogued for the first 2 years, proper fertilization and cultivation practiced to encourage strong cane growth, and new plantings made sufficiently frequently and old plantings destroyed as soon as they show signs of decline. Our most serious trouble with mosaic occurs where plantings are made, as they too frequently are, from stock taken from our old fields which are severely infected with mosaic. (C. M. Haenseler and J. H. Clark)

PENNSYLVANIA: The mosaics were general throughout the State. In well-cared-for commercial plantings the damage was slight. The streak diseases were found to have a State-wide distribution, being especially severe in the northwestern and southeastern parts. Leaf curl was found only in isolated patches. The total loss was about 3%. Control -- The presence of virus diseases was traceable to the failure to use disease-free plants, to close proximity to diseased wild or cultivated brambles, or to not properly roguing the berry patches. (George L. Zundel)

WEST VIRGINIA: Raspberry mosaic is of general occurrence in West Virginia but no accurate data on prevalence or severity are available. (J. G. Leach)

RASPBERRY WILT (Verticillium sp.)

MARYLAND: Owing to the practice of planting raspberries after tomatoes and potatoes many raspberry plantings in western Maryland are severely infested with Verticillium wilt. This disease is especially severe on poorly drained soil. Approximately 5% loss was caused by this disease last year but some growers suffered 10 to 20% loss. Control -- Do not set raspberry plants in poorly drained soil or areas subject to surface washing. Do not set raspberry plants immediately following potatoes or tomatoes. Use healthy planting stock. Maintain good soil fertility. Avoid transfer of soil from affected to clean plantings. (W. F. Jeffers)

RASPBERRY NON-PARASITIC DISEASE

MARYLAND: A condition which we are calling "fern-leaf" in Maryland has been noted in many Washington County plantings. The symptoms consist of a twisted and malformed growth of leaves, mainly on new canes. It is thought that this condition is the result of winter injury. (W. F. Jeffers)

STRAWBERRY RED STELE (Phytophthora fragariae)

MARYLAND: The red stele disease of strawberries is especially serious in several sections of the Eastern Shore of Maryland where poor drainage conditions exist. As the red stele organism lives in the soil for 10 years or more and is readily spread by surface water and by cultivating implements, etc., it has become the most serious disease of strawberries in Maryland and is rapidly assuming similar proportions in many other States. Estimated loss -- Approximately 25 to 30% loss in the strawberry crop occurs each year on the eastern shore from red stele. Loss for the State as a whole averaged about 8%. Control -- Control measures consist in planting healthy plants on clean soil and use of resistant varieties. Aberdeen and Pathfinder are the only commercial varieties at present showing resistance to the red stele disease. Several new resistant varieties will soon be released. (W. F. Jeffers)

NEW JERSEY: The red stele disease has caused very minor losses in commercial plantings. Thorough State-wide surveys, and a careful State inspection service supplemented by a vigorous educational campaign started immediately after the first infected planting was detected in 1937, and

focused on the urgent need of eradication of infected plantings and on the advantages of using only disease-free stock, have not only kept the red stele disease from increasing but have definitely reduced the number of known infected fields. Several varieties resistant to red stele, including Pathfinder and N. J. 312, have been developed here and other promising resistant seedlings are being tested. (C. M. Haenseler and J. H. Clark)

NEW YORK: Red stele has not yet appeared to be of commercial importance in New York State. In all cases investigated to date the incidence of the disease has been confined to areas of the fields too low and wet for strawberries under New York conditions. In cooperation with Dr. M. B. Hoffman, Extension Pomologist, the soil and subsoil in affected patches have been examined by the use of a soil tube. One grower calls it "wet stele" instead of red stele and the name appears justified so far as our limited experience with the trouble goes. (W. D. Mills)

WEST VIRGINIA: None observed. (J. G. Leach)

ORNAMENTALS AND TURF

AFRICAN-VIOLET (Saintpaulia)

NEW YORK: Powdery mildew (Cidium sp.) was seen in abundance in 2 greenhouses. Apparently it was distributed from a single contaminated source of plants. (A. W. Dimock)

CALLA LILY

NEW YORK: Spotted wilt (Lycopersicum virus 3) is seen increasingly in eastern greenhouses on recently purchased rhizomes from the West Coast. This should be recognized as important source of infection for tomatoes, peppers, and other food plants commonly started in mixed greenhouses.

Root rot (Phytophthora richardiae) was very common last winter, owing to laxity on part of growers. Control -- The standard formaldehyde treatment of rhizomes plus soil and container sterilization will give excellent control. Thiosan 1 lb. in 50 gals. for 90 minutes failed to give complete control but looked promising. (A. W. Dimock)

CARNATIONS

NEW YORK: Mosaic - An undescribed virus disease was very common this past winter and early spring and caused considerable loss in many varieties. The nature of the disease is not yet too clear.

Leafspot and branch rot - (Alternaria dianthi) - was exceptionally severe this season on field grown stock which was not benched before first week of July. Heavy, continued rains started at that time. (A. W. Dimock)

PENNSYLVANIA: Leafspot and branch rot this year were more severe than usual and caused at least 12% loss to the commercial growers. Control -- The double treatment of cuttings continues to reduce disease when combined with other control measures. Cuttings are first immersed in

1-1000 potassium permanganate, next the cut ends are dipped into dusts containing indolebutyric acid or naphthyl acetamide. (R. S. Kirby)

CHINA ASTERS - WILT (Fusarium conglutinans callistephi and Verticillium sp.)

MARYLAND: Both wilts were more common in 1942 than in other years. Estimated loss -- About 4%. (E. A. Walker)

NEW YORK: Fusarium wilt was severe in many plantings. Verticillium wilt probably was more common than is realized, the disease usually being attributed to Fusarium. (A. W. Dimock)

CHRYSANTHEMUM - WILT (Verticillium albo-atrum)
NEMATODE LEAF BLIGHT (Aphelenchoides fragariae)
SEPTORIA LEAFSPOT (Septoria chrysanthemi)

NEW JERSEY: The extremely rainy summer of 1942 probably accounts for the sharp increase of both Verticillium wilt and the foliar nematode. Some varieties of mums showed 100% infection by the Verticillium fungus in some plantings. The foliar nematode appears to attack a wider range of varieties, although a considerable range of susceptibility is also apparently present. There is still time for pathologists to inform county agents that losses from both troubles can be sharply curbed on next year's crop by taking certain precautions. Probably the most important is the method of propagation. Top cuttings of vigorous growing plants, as suggested by J. R. Christie, U. S. D. A.; A. W. Dimock, Cornell; and Paul Tilford, of Ohio State, seem to be of great help in reducing initial infections. This practice should be supplemented with sub-surface watering of propagating stock (to avoid leaf-wetting) and the use of clean soil or of disinfested old soil. (P. P. Pirone)

NEW YORK: Septoria leafspot and leaf nematodes were very severe in clothhouse and open-grown plantings because of the rainy season. Wilt was severe, though probably no more so than usual. Excellent control of Septoria leafspot was given by Fermate at 1-1/2 lbs. and 1 lb. per 100 gals. and by 4-4-100 Bordeaux. Even lower concentrations of both materials would probably be effective. Coverage of lower leaf surface is absolutely essential. The entire program of control is too detailed to give here. The indexing method developed here for obtaining Verticillium-free clones of chrysanthemum stock plants has continued to give satisfactory results. (A. W. Dimock)

PENNSYLVANIA: Leaf nematodes and wilt were present in greenhouses in the southeastern part of the State. Leafspots caused by Cylindosporium chrysanthemi and Cercospora chrysanthemi were more common than usual. (R. S. Kirby)

DELPHINIUM CROWN ROT (Solerotium delphinii)

MARYLAND: Crown rot is very destructive each year on delphiniums in Maryland. Crop rotation aids some in its control. Soil with good drainage and lacking organic matter is less likely to produce this disease. (E. A. Walker)

NEW YORK: Crown rot and other organisms were severe due to excessive moisture. (A. W. Dimock)

PENNSYLVANIA: Crown rot is the most destructive disease on delphiniums in this State. (R. S. Kirby)

GARDENIA ROOTKNOT (Heterodera marioni)

NEW JERSEY: Gardenias, roses, and several other greenhouse plants showed heavy infestation of the root knot nematode in some establishments. Steam sterilization and chloropicrin are recommended in New Jersey, but both methods have their shortcomings. A new product, Sani-Grow, is available, which the manufacturer claims can destroy nematodes in growing gardenia plants. Thus far this writer has been unable to substantiate these claims. (P. P. Pirone)

ORNAMENTALS DAMPING-OFF (Several fungi)

NEW JERSEY: Damping-off occurs on all seedlings. Exact losses are difficult to estimate but complete failure of certain lots of seedlings is not uncommon. Heretofore some form of heat or any one of several chemicals have been recommended either to disinfest the soil or to coat seeds. An excellent substitute (which appears to be even more effective than most of the standard treatments) is to sow seeds on sifted, moistened sphagnum as suggested by Hope, Stoutmyer, and Close of the U. S. Department of Agriculture. Their method has been used by several New Jersey nurserymen and florists this year and was found to give almost perfect control of damping-off. This method might well be extended to vegetable and other food crops started in flats indoors. (P. P. Pirone)

PHLOX

NEW YORK: Leafspot (Septoria phlogis and/or S. divaricata) was severe in most plantings because of excessive rainfall. (A. W. Dimock)

POINSETTIAS

NEW YORK: Bacterial canker (Corynebacterium poinsettiae) was noted causing considerable damage in a number of cases. (A. W. Dimock)

ROSE BLACKSPOT (Diplocarpon rosae)
MILDEW (Sphaerotheca pannosa var. rosae)

MARYLAND: Blackspot appeared on greenhouse and garden roses that were not sprayed or dusted, following the rainy periods in July and August, causing leaves to drop early and thus reduce the vigor of the plants. Control -- Dust with sulfur-copper dust 90-10 at 10-day intervals or following rains. Plant recommended varieties resistant to blackspot. (E. A. Walker)

NEW JERSEY: Blackspot continued to be the most prevalent leaf disease of the rose. The sulfur-copper mixture developed by E. W. Lyle in

Texas appears to control blackspot in New Jersey as well as it does in Texas. Dr. Lyle estimated that 20 lbs. of this 90-10 mixture is sufficient for 100 rose bushes for a season (1 lb. per 100 bu. at each application). He suggests that the plants be dusted within 24 hours after each rain. One commercial rose grower in New Jersey was able to control blackspot almost perfectly by weekly dustings. This, in spite of the fact that heretofore little control was obtained with several other materials, and that 1942 weather conditions were ideal for blackspot development. (P. P. Pirone)

NEW YORK: Blackspot was unusually severe in many localities both out of doors and under glass. Mildew was locally severe, but no more so than usual. (A. W. Dimock)

PENNSYLVANIA: Blackspot and mildew were more severe than for many years. Blackspot is the most destructive disease of roses. Its control has resulted in twice as many plants surviving the winter as where the disease was unchecked. Three-year trials gave best control on Bordeaux-sprayed plants, and second-best control on plants dusted with a dust containing 5% copper and 20% sulfur. A 80-10-10 sulfur, lead arsenate, lime dust rated third but under most conditions is effective enough for most home gardeners. (R. S. Kirby)

SNAPDRAGON - RUST (Puccinia antirrhini), POWDERY MILDEW (Oidium sp.)

MARYLAND: Rust appeared to be very destructive in many greenhouses and some outdoor plantings. Control -- Suggest light application of sulfur dust at frequent intervals before blossom period. Select disease-free cutting stocks. Some varieties have been produced that are resistant to rust in other States. (E. A. Walker)

NEW YORK: Powdery mildew was frequently encountered on glass-house snaps last winter. Rust in greenhouses was controlled by Fermate at concentrations from 1 lb. per 100 gals. down to 1/8 lb. per 100 gals. with very little decrease in control at lowest concentration. Fungisul at 1 lb. per 100 gals. also gave excellent control; lower concentrations were not tested. (A. W. Dimock)

PENNSYLVANIA: Mildew was observed in a number of greenhouses in Pennsylvania. (R. S. Kirby)

TURF (Golf) - LARGE BROWN PATCH (Rhizoctonia solani)
SMALL BROWN PATCH (Sclerotinia homoeocarpa)

PENNSYLVANIA: Large patch was spasmodically present this season particularly on greens in warm locations with poor air drainage. Control -- 10 lbs. of hydrated lime per 1000 sq. ft. applied every 2 weeks gave superior control over Spergon 3 oz. or 6 oz.; Thiosan 4-1/2 oz.; Calochlor 3 oz. or Semesan 4-1/2 oz.

Small patch was unusually severe during 1942. Control -- Thiosan 4-1/2 oz. to 6 oz. per 1000 sq. ft. applied every 2 weeks gave control almost as good as Calochlor at 3 oz. per 1000 and was better than Special Semesan at 3 to 4 oz. or 6 oz. per 1000. (C. C. Wernham)

ZINNIAS

NEW YORK: Alternaria disease (Alternaria zinniae) was severe and increasing in range. (A. W. Dimock)

POTATO

POTATO BACTERIAL RING ROT (Corynebacterium sepedonicum)

MARYLAND: Ring rot has not been reported from Maryland. (E. A. Walker)

NEW JERSEY: Very few cases of ring rot were reported this year. One car of seed brought into the State was discovered to contain infected potatoes and was subsequently sold as table stock. Two cases of ring rot were found in our late crop seed. (J. C. Campbell)

PENNSYLVANIA: Occurrence was general, even in seed-producing areas. Table stock yields were only slightly reduced (3%); however, losses were high (25%) in some instances. Control -- A general improvement in the amount of ring rot from certified seed was noted although numerous instances of its occurrence in such stock can still be found. A rather high percentage of failures were noted in attempts to "clean-up" farms having ring rot in 1941. Evidence of resistance in any of commonly used varieties was lacking. (C. D. Burke)

WEST VIRGINIA: Ring rot is definitely on the increase in West Virginia. No cases of excessive loss, however, were called to our attention in 1942. There was considerable soft rot in some fields that apparently was not associated with ring rot. (J. G. Leach)

POTATO BLACKLEG (Erwinia phytophthora)

MARYLAND: Found general in lower parts of field where air and soil drainage is poor. The disease is coming in on certified seed each year. Estimated loss -- About 1% of tubers infected. Control -- Use certified seed potatoes. (R. A. Jehle)

NEW JERSEY: No cases of blackleg were reported. (J. C. Campbell)

PENNSYLVANIA: Occurrence general, loss low, 0.5%, since most affected plants died early. Control -- Home-grown seed from certified in 1941 were relatively free of this disease since affected plants usually die before reproducing in Pennsylvania. (C. D. Burke)

WEST VIRGINIA: Although the weather conditions were favorable for blackleg no unusual amounts of the disease were observed. The amount of soft rot observed in tubers at harvest time would indicate that the disease may have been more prevalent than our records indicate. Because of the frequent rains there was some loss in certain varieties caused by bacterial soft rot of the tubers. (J. G. Leach)

POTATO EARLY OR ALTERNARIA BLIGHT (Alternaria solani)

MARYLAND: Early blight was more general than usual although it developed late in early crops following a prolonged rainy period. The late crop was so badly affected with late blight that symptoms of early blight were hard to detect. Estimated loss -- About 1%. Control -- Keep plants healthy by proper cultural methods and spraying. (R. A. Jehle)

NEW JERSEY: Early blight was practically of no importance on the commercial crop. Slight to moderate infection occurred on the late crop but was not of economic importance. (J. C. Campbell)

PENNSYLVANIA: Early blight was more general than in any past year on record, however, losses were negligible. Observations on control were too meager to make a statement on their efficacy. (O. D. Burke)

WEST VIRGINIA: Early blight was more prevalent than usual as would be expected in a wet year. In most cases late blight made it impossible to determine the amount of damage, since it completely obscured early blight before the latter disease had reached its peak. (J. G. Leach)

POTATO LATE BLIGHT (Phytophthora infestans)

MARYLAND: Late potatoes grown for home use were so badly diseased that most growers did not continue to dig their crop after seeing the rotten tubers in the first few rows dug. Commercial late potato growers suffered great loss where spraying was not done frequently enough. Reducing the copper in the Bordeaux mixture spray was disastrous and cannot be recommended in a severe late blight year. Poorly sprayed potato vines were comparatively free from late blight but tubers rotted worse than on unsprayed vines. In unsprayed fields the vines died early and did not serve as a supply of fresh spores to inoculate tubers with each rain. Estimated loss -- Much higher in 1942 than previous year. At elevation of from 2000 - 3000 ft. 50%, and from tidewater to 2000 ft., 20%. Early crop not seriously affected and loss was less than 20%. Control -- Spray with Bordeaux mixture 4-6-100 at 7- to 10-day intervals beginning when plants are about 7 inches high and make 7 to 10 applications. This will control the disease even in severe years. (R. A. Jehle)

NEW JERSEY: Late blight caused no injury to early varieties; slight damage to foliage but almost none to tubers in unsprayed fields of late varieties of the commercial crop. Severe injury was caused on the second crop (planted for seed purposes about the first of August), especially in non-sprayed fields. Losses ranged from a trace to complete destruction. Adequate coverage with Bordeaux gave excellent control. (J. C. Campbell)

NEW YORK: In 1938 this disease was estimated to have caused a loss of 45%, in 1940 of 25%. Conditions this year seemingly have been more favorable for blight than in either of the earlier years, yet losses probably won't exceed 15%. The total production of potatoes in all 3 years was approximately normal as was also the case in the years of larger losses. The

reasons why production has been maintained in the face of epidemic conditions are 2. In the first place, and to an increasing extent, commercial acreages of potatoes are being protected by spraying with Bordeaux mixture. In the second place, the same weather conditions which bring about blight epidemics also bring about high yields. If similar conditions should prevail in 1943 and if the shortage of copper should prevent commercial growers from spraying, we may expect potato production in the State to be cut one-half or more. (K. H. Fernow)

PENNSYLVANIA: Late blight appeared early in 1942, being observed by June 13, and was present in every county in the State by the middle of July, causing severe defoliation, especially in the Mountain Counties. The disease has caused less tuber rot than would have been expected, owing probably to a dry period starting toward the last of August. Unsprayed fields were destroyed. Estimated loss -- Reduction of 23% from usual yields. Control -- Spraying when started early and repeated at 6- to 7-day intervals gave fairly good control but did not entirely prevent blight appearing in low spots in fields. Cutting strength of Bordeaux below 8-8-100 and using substitute materials was disastrous. Blight caused serious losses in dusted fields. (O. D. Burke)

WEST VIRGINIA: Late blight was very prevalent in West Virginia. It was first observed in late June and caused severe injury throughout the State. It did considerable damage in fields that were sprayed but, where spraying was most efficient, injury was delayed until early varieties had matured. In one experimental field dusting gave almost as good control as spraying. In this field the strength of the copper in the dust was reduced progressively; reducing the strength of copper one-half did not result in a significant decrease in yield as compared with full strength. (J. G. Leach)

POTATO PURPLE TOP WILT (Virus)

MARYLAND: This disease is not common in the Coastal Plain potato producing area and has not caused any appreciable loss in the western part of the State where it has been present for several years. (R. A. Jehle)

NEW JERSEY: Purple top wilt was not prevalent this year; no cases were reported. It was severe in some Katahdin plantings in 1941. (J. C. Campbell)

PENNSYLVANIA: Occurrence of purple top was much less common than in past years, however, York County had losses up to 50% of the tubers and every planting showed the disease. In other counties very little loss could be noted. Control -- Early varieties escaped infection and Katahdin and Sebago expressed only mild symptoms. (O. D. Burke)

WEST VIRGINIA: This disease apparently was less prevalent than it has been in past years although in some local areas as many as 50% of the plants were affected. As in past years the earliest varieties escaped severe injury. (J. G. Leach)

POTATO RHIZOCTONIA (Rhizoctonia solani)

MARYLAND: Rhizoctonia was slightly more abundant than last year. The wet early season may have caused some increase. Estimated loss -- About 3%. Control -- Plant potatoes on well drained soil. Practice at least a three year rotation. (R. A. Jehle)

NEW JERSEY: Very limited observations were made but it is believed that occurrence of Rhizoctonia was slightly greater than usual. The general dry conditions during April and May delayed germination and several fields showed very poor stands, especially on knolls and light soil types where potatoes may have been planted too deep. (J. C. Campbell)

PENNSYLVANIA: Occurrence was general and losses average 4% owing mainly to wet, cool, and poor growing weather early in the season (planting time). Control measures were not generally practiced since the disease usually causes very little trouble. (C. D. Burke)

WEST VIRGINIA: No extensive observations were made on the presence of Rhizoctonia. In a normal year it does not cause much damage. Seed treatment experiments conducted in several areas showed no benefits indicating that the disease probably did not do much damage. (J. G. Leach)

POTATO SCAB (Actinomyces scabies)

MARYLAND: Potato scab was more prevalent in 1942 than in the previous year. Heavily limed soils resulted in more scab than acid soils. Estimated loss -- 6% in 1942 and only 5% in 1941. Control -- If scabby potatoes must be planted select those with only shallow scab and treat seed with Improved Semesan Bel or other recommended treatment. Avoid liming potato land unless it is very acid. (R. A. Jehle)

NEW JERSEY: Very little damage is caused by scab since most growers plant on soils of low pH. A few local areas were reported but treatment with sulfur usually controls the disease very readily. (J. C. Campbell)

PENNSYLVANIA: Occurrence was general, and losses 1%; severe only on limed soils. Control -- No serious outbreaks on soil at pH5. However, one area with soil of limestone origin testing pH7 or more shows no scab excepting where liming has been practiced. (C. D. Burke)

WEST VIRGINIA: Very little scab was observed. Because of the general high acidity in the soils of this State scab is not very prevalent. However, it has been observed causing heavy infection in certain local areas. (J. G. Leach)

POTATO VIRUS DISEASES

MARYLAND: Yellow dwarf was present to about same degree as in former years. Mosaic is present to a small extent in the Coastal Plain area. There is a tendency for mosaic in the mountain region at elevations over 2000 ft. Leafroll appeared to be increasing this year over 1941 and there

was little difference between the amount of the disease at low or high altitudes in the State.

Disease	Percent Loss: Elevation Tidewater to 2000 ft.	Percent Loss: Elevation 2000 to 3000 ft.
Yellow dwarf	Trace	Trace
Mosaic	1.5	0.5
Leafroll	3.0	3.0
Spindle-tuber	0.5	0.5

Control -- Careful roguing of seed plots. Prefer tuber-unit planting methods, combined with careful field inspection and roguing. (R. A. Jehle)

NEW JERSEY: No increase in virus diseases was evident. As usual, some few lots of certified seed contained 20 to 30% leafroll. The other viruses were not of any importance. Since over 85% of all seed used in the State is certified, the losses from viruses are slight. (J. C. Campbell)

What appears to be an undescribed disease, virus in nature, was observed in 4 potato fields in Central Jersey this year. This disturbance was reported in the August issue of HINTS TO POTATO GROWERS, Vol. 23, No. 4. Some of the symptoms of the affected plants are a shortening of the internodes, and a reduction of the angle between the petiole and stem, especially at the top of the plants. There also occurs a mild thickening of the main stem of the plant. Together with the shortening of the stems, many buds that normally remain dormant are stimulated into activity so that one shoot, or sometimes more, arises at each of most of the nodes. This abnormal shoot production gives the plant a very compact, leafy appearance. The affected plants examined have also exhibited a large number of small leaves, particularly at the top of the plant. These leaves often exhibit a mosaic pattern of yellowish and greenish spots. Cupping or rolling of the leaves is a common symptom. Badly affected plants are usually smaller than the neighboring healthy plants. Where the symptoms are not so pronounced the affected plant can usually be first observed by its somewhat broader and more compact tops. (R. H. Daines)

NEW YORK: Normal incidence of leafroll in New York potato fields is probably about 5 or 6% with losses averaging around 2%. The low incidence is due to the fact that in portions of the State where leafroll spreads rapidly it is customary to replace seed each year or two with certified seed. In 1942 samples of about 50 lots of Long Island home-grown seed were treated in Florida. This seed showed an average of 46% leafroll. Some lots of certified seed also showed high percentage but could be discarded because of the test thus keeping the losses due to leafroll to about 3% of the crop. (K. H. Fernow)

PENNSYLVANIA: Leafroll, mosaic, and yellow dwarf on stock planted from certified seed were generally too high indicating that certification authorities can and should look toward the tightening of regulations. (C. D. Burke)

WEST VIRGINIA: The virus disease situation was about normal. No significant increase or decrease was observed in amount of infection. It varies according to the source of the seed stock. (J. G. Leach)

POTATO WILT (Fusarium eumartii)

MARYLAND: Wilt was less severe in 1942 than usual in all parts of the State. The small loss probably resulted from abundant and well distributed rainfall in the potato-growing regions. The disease was more prevalent in the Eastern Shore early crop where hot dry weather prevailed during the early summer months. Estimated loss -- About 1%. Control -- Use better cultural practices to conserve moisture and grow strong healthy plants. Use best seed obtainable and practice at least three year rotations. (R. A. Jehle)

TOBACCO

TOBACCO ANTHRACNOSE (Colletotrichum sp. or Gloeosporium sp.)

MARYLAND: Anthracnose appeared in the greenhouse on May 7 and in farmers' seedbeds on May 15, as a general infection over the tobacco growing area. The disease spreads rapidly during wet weather and is most severe in low, poorly drained bed land. Small seedling plants are killed; larger seedlings show leaves with thin, sunken, ashen-gray spots with brownish borders; lateral veins brown to cause a spinach-like appearance; midrib and stalk have numerous oblong sunken greenish-brown lesions. The disease was found in the field during 1942, persisting on leaves, midrib, stalk, and flower head. It was severe in low wet land. It has been common for the past 2 years in Maryland, but was unreported elsewhere. Estimated loss -- Reduction in number of plants in seedbed about 5%. Total loss in some sections. Loss in field negligible in Maryland cigarette-type tobacco. Control -- No definite seedbed control recommended. Suggest spraying seed beds with Bordeaux mixture 4-6-50 at 10-day intervals beginning just after plants emerge from ground. Four percent Spergon has reduced infection in greenhouse. Clean tobacco seed and treat with Ceresan. (E. A. Walker)

PENNSYLVANIA: Anthracnose was observed on a few plants in 3 beds on June 12, 1942. Because of the widespread occurrence of blue mold this disease was difficult to determine. (C. D. Burke)

TOBACCO BLUE MOLD [downy mildew] (Peronospora tabacina)

MARYLAND: Blue mold is a destructive plantbed disease. Early-affected plants have yellowish puckered leaves usually cupped with tip and margin turning downward. Badly affected leaves have scorched appearance.

Blue mold first appeared on May 4, somewhat later than usual. Spreading rapidly, it became destructive to plant beds following rains on May 21 to 23. The disease was light this year although it was continuous in untreated beds and delayed transplanting about 10 days in some sections in spite of the dry season. Late beds face greater danger from blue mold than early beds do because the plants are smaller at the time blue mold strikes most severely. Large plants recover in 10 days; small plants are killed or stunted. Badly infected beds have the odor of decomposed wet vegetable matter. The disease was not reported in the field. Estimated loss -- Reduction of 5 to 15% in young plants in bed and delay of 10 days in transplanting. Control -- Increased number of growers are using paradichlorobenzene crystal gas treatment as a cure at a rate of 1-1/2 to 2 lbs. per 100 sq. yds. of bed area on 2 successive nights at 5- to 7-day intervals. Spraying the beds twice weekly with 7 to 8 applications beginning 10 days before blue mold appears is an excellent preventative. Cuprous oxide 1/2 lb., cotton seed-oil, 2 quarts, and water 50 gals., ferric-dimethyl-dithio-carbamate (Fermate), or bismuth sub-salicylate 1-1/2 lbs., Vatsol O.T.C. (sodium dioctyl sulfosuccinate) 1 lb., water 100 gals. are good spray materials to use for blue mold control. (E. A. Walker)

PENNSYLVANIA: Blue mold was observable in most seed beds, varying from a trace to moderate attack. The first appearance was on May 8 with more serious attack after May 15. Some young plants were killed while leaves on older plants were destroyed but buds undamaged. Recovery followed in 10 days. Early plants were often pulled before the disease became severe. Estimated loss -- Delay of about 10 days in transplanting occurred in some cases. There was about 10 to 15% loss in killed plants, but an actual shortage of plants was rare. Control -- Measures for control were applied in a small proportion of cases with the use of paradichlorobenzene. Some experimental tests of ferric-dimethyl-dithio-carbamate (Fermate) using 1-1/2 lbs. to 100 gals. gave results indicating that this spray might become an effective method of control. (W. S. Beach - C. E. Street)

TOBACCO HOUSEBURN (Various fungi)

MARYLAND: This is a common deterioration disease with air-cured tobacco. It was worse in 1942 than usual because of high air humidity during harvest, and crowding of barns on account of rapid ripening of the crop in the field. Application of heat was generally used too late to save crop. Leaves, petiole, and stalk were affected. Diseased leaves are dark brown to black in color, crumble easily when dry, and have no market value. A musty odor emanates from the diseased leaves when stored. Houseburn occurs after the leaves have yellowed and before they are cured. Estimated loss -- From 15 to 20% of crop was damaged in 1942 with further loss expected in the stripped and packed tobacco if handled too wet. Control -- Use pit or stove heat in curing barns during critical houseburn weather. Open barns to increase circulation during drying weather. Maintain at least 6°F. difference between wet- and dry-bulb thermometer readings. (E. A. Walker)

PENNSYLVANIA: Houseburn was uncommonly prevalent in 1942 on 30% of the crops harvested during cloudy weather before August 20, but later harvested crops were not damaged. Some crops went into the barns with leaves and stalks full of water and only slightly wilted. Timely use of heat saved a small percentage of crops from deterioration but many farmers were not equipped or prepared for the unusual situation. Estimated loss -- Ranged from 25 to 50% on early, 10 to 15% on medium, and none on later harvested tobacco. Additional losses will be observed after the crop is stripped. Control -- Apply heat to barns during unfavorable weather. Use of fires is not practical in barns used for housing straw, hay, corn-fodder, livestock, machinery etc. Preliminary wilting on frames or scaffolds is practicable. Less crowding on lath and in shed with more adequate ventilation is recommended. There will be some shortage of charcoal fuel during war. (O. E. Street, and W. S. Beach)

TOBACCO MOSAIC, VIRUS (Marmor tabaci var. vulgare)

MARYLAND: Mosaic is usually a field disease, but is sometimes found in the plant bed. It was abundant in 1942, but most severe in 1941. Isolated plants in the field showed infection 10 days after the transplanting. It was spread rapidly by cultivation, hoeing, etc., and after topping suckers become badly infected. During the last 2 years a large amount of mosaic appeared after heavy rains, indicating a possible relationship between nitrogen deficiency and increased virus symptoms. Early affected plants are dwarfed. Affected leaves show mottled yellowish-green and dark-green areas that may become puckered. On hot days the leaves may become necrotic or show dead areas. The disease is spread by workmen through careless handling of the previous season's diseased crop or use of diseased tobacco while working with the growing crop. Estimated loss -- About 8 to 10% of crop leaves are damaged resulting in poor quality when cured. About 40% of suckers have mosaic, which causes no commercial damage. Control -- Rogue out diseased plants. Top diseased plants last. Use field and seed bed sanitation. Furnish laborers with sterilized tobacco instead of letting them use virus-bearing tobacco for chewing and smoking. Resistant types are being derived from Ambalema tobacco. (E. A. Walker)

PENNSYLVANIA: Mosaic had average prevalence in 1942. Seed bed infection is occasional and this results in a high percentage of field disease. Cigar smoking sometimes results in occurrence above the average. Native weed carriers and carry-over in the soil probably are factors in less extensive cases. The disease is spread some by cultivation, hoeing, and worming, but more by topping and suckering. Loss consists of stunting and necrotic spotting (mosaic rust) following hot days in the case of early infection. Sucker infection is not detrimental as development is too late. Estimated loss -- About 5% on account of small size, low weight and poor curing of leaves, as well as by necrotic spotting. Control -- Some growers understand how mosaic is spread and practice sanitation. Seed beds are earlier than most vegetation and tend to escape infection from wild carrier plants. Use of native leaf by growers is not common. (W. S. Beach and O. E. Street)

TOBACCO WILDFIRE (Pseudomonas tabaci)

MARYLAND: Wildfire appeared in tobacco plant beds later this year than usual. The plants were large enough to transplant when most severe attack came. A large number of plants had systemic infection. Diseased plants set out in the field spread wildfire so that field infection as blackfire was very severe at topping time following water-soaking of leaves with the unusually heavy rainfall. Regular spraying of plant beds with Bordeaux mixture (4-6-50) at least 3 times during early growth of seedlings prevents appearance of the disease in the beds. Estimated loss -- In plant bed about 3 to 4%. In field as blackfire about 10 to 12%. Control -- Spray with Bordeaux mixture (4-6-50) beginning when plants are all well germinated and through the ground. Continue at 10-day intervals until 3 to 4 applications are made. Spray the cotton covers and side boards as well as the plants. Avoid bruising of plants, chewing of home grown tobacco, and practice general seed bed sanitation. (E. A. Walker)

PENNSYLVANIA: In recent years, wildfire has occurred in a great majority of seed beds, but in 1942 prevalence was less than usual. Beds properly sprayed with Bordeaux had few or no symptoms. From transplanting to mid-August, rainfall was frequent and much above normal. Early crops exhibited extensive spotting with the higher or top leaves affected. The spots, however, were of the halo type, not great in diameter and seldom coalesced, hence damage was low in proportion to the number of infections. On late crops, spotting was less and confined more to lower leaves. Indications are that the crop, in general, has very good burning quality, tending to off-set leaf spot damage. Estimated loss -- About 10% in unsprayed plant beds. In field about 15 to 25% on early and medium planted crop, and about 3 to 8% on late planted crop. Firing due to potash deficiency was less than usual. Field infection was abundant in the wet season. About 75% of the field damage was not traceable to seed bed infection. Control -- Spray plant beds early and thoroughly with Bordeaux mixture, commencing not later than the seed-leaf stage or seedling growth. Addition of side dressings of potash fertilizer in bed and field aid in better control of wildfire. (W. S. Beach and O. E. Street)

TRUCK CROPS

TRUCK CROPS - DAMPING-OFF

WEST VIRGINIA: During the spring of 1942 we started a survey of organic materials which might be used as substitutes for copper and mercury salts. In tests, tetramethyl thiuram-disulphide at 80% concentration (Japanese beetle spray) and ferric dimethyl-dithio-carbamate (Fermate) showed considerable promise as seed protectants. In later tests Thiosan (50% tetramethyl thiuramdisulphide) was included. These tests were conducted in greenhouse loam soil at pH values of 5.2 to 5.4. High soil moistures were maintained. At the beginning of the tests Pythium sp. was introduced into the soil as inoculum. Isolations from damped-off plants

yielded Pythium sp. In preliminary trials beneficial results were obtained on cabbage, carrot, cantaloup, peas, spinach, tomato, and sweet corn; both materials being at least as good as Cuprocide.

In later trials on spinach, dosages as low as 0.1% by weight of these materials were more effective than either Cuprocide or zinc oxide at 2% in preventing pre-emergence damping-off. With both Thiosan and Fermate protection increased with increasing dosages until the maximum possible adherence load was reached. It is believed that dosages of from 0.5 to 1.0% will be most efficient in offering protection and conserving materials.

Equally favorable results have been obtained with cabbage, both Thiosan and Fermate at 1.0% proving superior to Cuprocide, zinc oxide, Semesan, or Spergon at recommended rates.

There was some evidence of injury on lettuce as indicated by reductions in emergence. At maximum adherence loads emergence was delayed and the final stand was reduced. Reduction in dosage resulted in increased stand. However, in no case did stands of lettuce with either of these materials equal those obtained with Cuprocide at 2%. (C. F. Taylor)

ASPARAGUS RUST (Puccinia asparagi)

NEW YORK: In 1942 only one heavily infested field was found. Traces occurred in a small number of other plantings. Where only the Washington varieties are planted, and the stock procured from seedsmen who lately have tested for rust-resistance, there is almost none of the disease. It was absent from the State until the Paradise variety was introduced. This strain not only was extremely susceptible but seemed to carry the inoculum with it. The last field of these plantings is being plowed under, and we hope the rust will again disappear. (Charles Chupp)

BEAN ANTHRACNOSE (Colletotrichum lindemuthianum)

MARYLAND: Bean anthracnose was destructive locally in home gardens and victory gardens, but did not cause any appreciable loss in commercial plantings. (C. E. Cox)

NEW JERSEY: There was more in 1942 than in recent years but it caused very little loss. The disease has disappeared as an important bean problem since western-grown seeds are generally used. (C. M. Haenseler)

NEW YORK: After many years of almost complete absence of bean anthracnose from New York State, it appeared in almost epidemic form in 1942. The actual sale loss of one grower was $15,000 and of another, over $50,000. Because of the difficulty in procuring seed from the Twin Falls area (Idaho) and since much of the western seed is heavily infected with mosaic, more and more eastern-grown seed was planted. During the "thirties" most of the seasons were dry enough so that Colletotrichum did not multiply. But 1942 being a wet year, the disease spread rapidly, and in some cases destroyed whole fields completely. Rarely, the seedsman insisted that he handled only western-grown stock. In every instance, however, where anthracnose appeared in epidemic form, we were also able to prove that it was eastern seed. (Charles Chupp)

PENNSYLVANIA: Anthracnose was the most widespread and destructive that it has been for many years. Commercial bean growers had their greatest difficulty in September. The average State loss was about 3%. Control -- Clean seed was important. Several growers reduced the amount of pod spotting by applying Bordeaux in the field. (R. S. Kirby)

BEAN BACTERIAL BLIGHT AND HALO BLIGHT (Xanthomonas phaseoli and Pseudomonas medicaginis var. phaseolicola)

MARYLAND: Bacterial blight of bean was generally less severe in 1942 than in 1941. The diseased fields observed were all planted from a single lot of seed reported to be of western origin. Estimated loss -- About 5% in lower Eastern Shore country. No appreciable loss in remainder of State. Control -- Use western grown seed free from disease. (C. E. Cox)

NEW JERSEY: Bacterial blight determined as due to Xanthomonas phaseoli caused more serious trouble on Fordhook Lima beans in 1942 than for many years past. A few fields in southern New Jersey were almost totally destroyed by August 10 and others showed 10 to 30% loss due to both foliage and pod infection. Abundant rainfall and high humidity favored the development of the blight this year but infection of seed lots was apparently responsible for the local distribution of the disease. Green beans this year showed little bacterial blight although in other years heavy losses have been experienced in certain fields evidently planted with infected seed. No data on seed sources have been obtained in most cases of blight outbreaks but the appearance of the disease in local fields emphasizes the importance of infected seed lots and the need for some system of bean seed certification which would guarantee blight-free seed. (C. M. Haenseler)

WEST VIRGINIA: Observations were not sufficient for making an accurate estimate. (J. G. Leach)

BEAN TIMBER ROT (Sclerotinia sclerotiorum)

NEW JERSEY: Of no importance. (C. M. Haenseler)

NEW YORK: Timber rot has been common and destructive in many bean fields during 1942. The wet weather no doubt is responsible. Dr. H. S. Cunningham at the Riverhead Experiment Station reports one field of Lima beans with 80% infection. The Limas followed a spring crop of peas which also were infected. (Charles Chupp)

PENNSYLVANIA: Occurrence reported only in Bradford county, loss a trace. (H. Bauer)

WEST VIRGINIA: None reported in 1942. (J. G. Leach)

BEAN (LIMA) MOSAIC (Virus)

NEW YORK: The vines of a small planting of lima beans at Geneva were heavily infected with cucumber virus 1. The inoculum came from an adjoining experimental planting of various mints. The disease is very destructive to limas. (Charles Chupp)

CABBAGE ALTERNARIA LEAFSPOT (Alternaria circinans)

NEW JERSEY: More in 1942 than usual but of little economic importance except in occasional late plantings and in very susceptible varieties. Several years ago Harris Ball Head was almost a total loss due to alternaria leafspot in one field where other varieties planted in adjoining rows were only slightly affected. Inoculation tests indicated that Harris Ball Head is much more susceptible than Danish Ballhead, Short Stem (Harris) and Midseason Market (Harris). Seed treatment with hot water 122°F for 25 minutes has controlled very successfully alternaria spot on cotyledons and hypocotyl of seedlings but no effort has been made to control the disease in the field. (C. M. Haenseler)

PENNSYLVANIA: Leafspot was the most destructive cabbage disease this year. The pathogen caused heavy losses in the northwestern part of the State following numerous fall rains. Some fields were so badly diseased that no cabbage was harvested. For the State as a whole there was a loss of at least 15% of the fall crop. The loss in early and midseason cabbage was insignificant. Control -- Treat seed with hot water (122°F) for 25 minutes and follow a rotation of 4 years between cabbage crops. The disease may be checked in wet years by spraying with 8-8-100 Bordeaux mixture plus 1 pound of calcium caseinate. (O. S. Cannon)

WEST VIRGINIA: No observations. (J. G. Leach)

CABBAGE BACTERIAL SOFT ROT (Erwinia carotovora)

NEW YORK: The bacterial soft rot of cabbage was far more destructive in 1942 than during the average season. Nearly every rainfall was accompanied by high temperatures. In addition, lack of labor resulted in much later cultivation than usual. When the leaves were large and succulent, the cultivating tools broke many of them. Infection followed almost every injury. In at least 2 fields there was as much as 40% loss of heads. (Charles Chupp)

CUCURBIT ANTHRACNOSE (Colletotrichum lagenarium)

DELAWARE: Anthracnose was much more prevalent in 1942 owing to the favorable weather conditions of mid summer. Complete destruction took place in a few days in some plantings. Average losses were low. (S. L. Hopperstead)

NEW JERSEY: No more severe than usual in 1942. Foliage in well-sprayed fields remained in good condition throughout the season. (C. M. Haenseler)

NEW YORK: The high temperatures that usually accompanied the rains in 1942 were favorable for the spread of this disease. Where spraying or dusting was not well done, the cucumber and muskmelon crops were killed in the middle of the season. Because of the sudden destruction of entire fields, farmers referred to the trouble as "fire" or "frost". (Charles Chupp)

PENNSYLVANIA: Above-normal rainfall from July to September enabled this disease to be unusually destructive. The average State loss was about 5%. Spraying and dusting reduced loss. (R. S. Kirby and A. H. Bauer)

WEST VIRGINIA: No observations made in 1942. None reported to Department of Plant Pathology. (J. G. Leach)

CUCURBIT MOSAIC (Cucumber Virus 1)

NEW YORK: Cucurbit mosaic occurred in epidemic form even though the insect vectors were supposed to be less common than usual. Three experimental cucumber plots were isolated from weeds and other cucurbits. One plot was in the center of a closely mown meadow and remained free from mosaic. The other 2 plots were each in the center of a soybean field free of weeds. These cucumbers were heavily infected. There is some indication that this soybean virus was cucumber virus 1. (Charles Chupp)

PEA SEED DECAY (Several soil fungi)

NEW JERSEY: Spergon and Thiosan have given slightly better control of seed decay than red copper oxide in several test plots but red copper oxide was used on a large scale with good results in commercial plantings. (C. M. Haenseler)

PENNSYLVANIA: About 20% of the pea seed planted in Pennsylvania in 1942 failed to grow because of seed decay. Control -- At demonstrations conducted on 11 different farms an average stand increase of 22% was obtained by dusting seed with Spergon before planting. Yield data was obtained at 3 places. On these farms the average yield of shelled peas from an acre was 19% greater than the yield from untreated seeds. This was an average increase of 393 lbs. of shelled peas from an acre. At 6 places Spergon increased the stand 29% as compared with a 23% increase from Thiosan. At the 2 places where yields from these 2 materials were compared the yield increases were 25.4% for Spergon and 12% for Thiosan. (O. S. Cannon)

CORN (SWEET) BACTERIAL WILT (Bacterium stewartii)

MARYLAND: Stewart's disease is very destructive to our sweet corn used for canning since many susceptible varieties are still being grown. Among these may be mentioned Stowell's Evergreen, Shoepeg, and Golden Bantam. Golden Cross Bantam is replacing Golden Bantam for table use and

to some extent in the canning industry. It shows some blight which does not seriously affect the yield. Estimated loss -- About 2% for all varieties. Control -- Avoid early planting of susceptible varieties. Use resistant varieties. Suggest Golden Cross Bantam as a good yellow variety. (E. A. Walker)

NEW JERSEY: Bacterial wilt was probably slightly more prevalent in 1942 than in 1941. Golden Bantam showed 13% wilt at New Brunswick in 1942 on the same plot where it developed 5% wilt in 1941. In southern New Jersey wilt was very erratic in its distribution, being severe in one field and very slight in others. The average daily temperature during the winter months December, January, and February before the 1942 season was 33.7°F for the Burlington county area and 32.2°F for New Brunswick. These are close to the critical temperatures which in past years have been followed by "moderate amount of wilt". Our wilt-free years have usually been preceded by winters with average daily temperatures below 30°F and our very "severe wilt" years by winters with average daily temperatures of 35°F or higher. After winters with an average daily temperature of between 30° and 35°, as in 1942, the wilt is usually very localized in its occurrence. The only control attempted is to plant partially resistant hybrids. General use of such hybrids has greatly reduced losses from wilt. (C. M. Haenseler)

NEW YORK: Bacterial wilt was lacking almost entirely in New York State in 1942. The only report was a trace in one section of Nassau County, Long Island. The average mean temperature for the previous winter months was 27.4°F. This apparently is almost in the danger zone. In former years a small amount of wilt was found when the average temperature was 28.2°F. In the epidemic years of 1932 and 1933 the average temperatures were 32.7°, and 32.5°F, respectively. In addition to temperature it is necessary to have abundant inoculum for an epidemic. Since the inoculum has disappeared almost entirely, there is not much danger for 1943 even though the temperatures should average above 32°F. (Charles Chupp)

PENNSYLVANIA: Bacterial wilt was fairly common on susceptible varieties this year. One field of Golden Bantam in Philadelphia county had 35% wilt. Most of the sweet corn now grown in the State is of the resistant hybrid varieties and these had little or no wilt. First observed on June 19. Average loss was a trace. Control -- Planting the resistant hybrid varieties. (R. S. Kirby)

WEST VIRGINIA (See also under field corn, CEREAL CROPS): The disease was prevalent but no destructive outbreaks were observed. Leaf infections were often obscured by Helminthosporium leaf blight. (J. G. Leach)

SWEETPOTATO WILT, YELLOWS, SPLIT STEM (Fusarium batatatis)

DELAWARE: Wilt or yellows of sweetpotato has been severe in the little stem (Jersey types) this season, probably related to high heat in the seed beds, with high temperature and droughty conditions at time of setting and prior to setting. Estimated loss -- 25 to 50% of stand, with

an average of 35%. Control -- Most easily controlled by growing "slip seed", that is, stock grown from cuttings or "slips" consisting of vine clippings 12 to 14 inches long taken from healthy plants. Often the dipping of the sprouts (young plants) in disinfectants assist in control. Spergon gave better control this season than organic mercury or yellow copper oxide. (T. F. Manns)

TOMATO ANTHRACNOSE (Colletotrichum phomoides)

MARYLAND: Anthracnose made its appearance earlier this year than usual. The estimated average loss for the State from this disease was about 2%. This is only slightly above the estimated 5-year average of 1.7%. (C. E. Cox)

NEW JERSEY: Anthracnose was very destructive in many fields and particularly severe after plants had been partially defoliated by leaf blights. Observations have indicated that plants fed, sprayed, and otherwise handled so that they retained good foliage until the end of the season developed less anthracnose on the fruits. We have no evidence that the disease can be effectively controlled by sprays but where leaf blights and anthracnose are associated in the same field the losses from anthracnose seem to be appreciably reduced, probably indirectly, by the sprays. There is urgent need for more information on many phases of this very destructive disease. (C. M. Haenseler)

PENNSYLVANIA: Anthracnose was present in all parts of the State and was more destructive than for many years. The heaviest loss occurred in the southeastern and the northwestern parts. The disease was observed August 18 and the average State loss was 8%. Control -- Field rotation, clean plants, and wide spacing in the field are recommended. The abnormally wet July and August allowed the disease to become general under all growing conditions. Field spraying of tomatoes is not a general practice in this state. (R. S. Kirby, C. S. Cannon, A. H. Bauer, and G. L. Zundel)

WEST VIRGINIA: Few observations were made on anthracnose. The disease was present in most fields and contributed to fruit decay although most of the rot was due to Phytophthora rot. (J. G. Leach)

TOMATO ALTERNARIA CANKER AND LEAFSPOT (Alternaria solani)

DELAWARE: Alternaria canker and leaf spot was responsible for more damage than Septoria leaf spot during the 1942 season. The disease was most prevalent in the two northern counties. Estimated average losses were from 7.5 to 10%. Spraying and dusting when practiced gave excellent control. Fruit from sprayed or dusted plantings generally graded higher. (S. L. Hopperstead)

MARYLAND: Alternaria leafspot was widespread and during the height of the harvest season hardly a plant could be found that did not show some lesions. Very late planted tomatoes were less severely attacked than the main crop. The collar rot stage of the disease on seedlings was less severe

than in previous years. The dry weather early in the season apparently prevented its development; however, subsequent development of the leafspot occurred when rainfall was heavier indicating that abundant inoculum was present. Estimated loss -- The average loss was estimated at 5%. Control -- Field spraying for control of leafspot is not recommended in this State, as a profitable crop can ordinarily be harvested before defoliation becomes severe if healthy plants are transplanted to fields in which the fertility is maintained and a proper rotation practiced. (C. E. Cox)

NEW JERSEY: Canker was very severe in a few fields set with infected lots of southern-grown plants. A few fields required 25 to 50% replanting, while a few others were so severely cankered that they were plowed and reset or planted to another crop. The leaf blight phase of the disease was very prevalent during September and associated with Septoria and Stemphylium blights caused almost 100% defoliation in a large percentage of fields by the time half the crop was harvested. This is the first season that the Stemphylium leaf blight has been diagnosed here. Very severe anthracnose followed in many of the severely defoliated fields. Sprays gave only a partial and inadequate control of the leaf defoliation complex. (C. M. Haenseler)

NEW YORK: The Alternaria blight was fairly prevalent the past season. It caused at least 5% average loss, and in some fields almost defoliated the plants. Excellent results were obtained by spraying beginning about the middle of July. In a demonstrational way attempts were made to control the blight by 2 or more side dressings with nitrates, beginning just as the first fruits were forming. There was considerable evidence that where all other conditions for luxuriant growth were present, nitrate applications reduced the blight almost as much as did spraying. But in most fields, especially in the western part of the State, there were other malnutrition problems, and where these occurred, nitrates were of no value for blight control. (Charles Chupp)

PENNSYLVANIA: Alternaria canker and leafspot disease was present in every county. It was most severe in the northeast, less severe in center and northwest, and below average in the southwestern and southeastern parts of the State. The disease was first observed in the field on May 28. Estimated loss -- Average loss for the State was 10%. Control -- Plants produced from seed treated with mercury, grown in clean seedbed soil, sprayed in the seed and transplant beds with copper, and transplanted to fields having at least a 3-year rotation, produced crops having almost no disease until late in the season. Southern plants varied from clean to severely diseased. The disease increased in most southern plants, the amount varying according to the time they were held before planting. In one case part of a lot of plants later developed .5% disease when planted immediately on arrival and part of the same lot stored for 9 days developed 31% primary canker in the field. (R. S. Kirby, O. S. Cannon, A. H. Bauer, G. L. Zundel, and O. D. Burke)

WEST VIRGINIA: Alternaria leafspot was very prevalent throughout the State. In all the fields in which it was observed it was more prevalent and did more damage than Septoria leafspot. It was estimated that the loss from Alternaria and Septoria leafspots was approximately 10%. Some control was obtained in one field by spraying the plants with copper oxide and with Fermate. Spraying was started late, however, and control was only partial. It is believed that a spray program started early in the season would have been effective in controlling the disease. (J. G. Leach)

TOMATO BACTERIAL CANKER (Corynebacterium michiganense)

NEW JERSEY: This year canker was limited to a few farms where home-grown seed are used. Our strict adherence to the regulations that no field showing even a trace of bacterial canker be accepted for seed certification, we believe, has eliminated the canker problem from our principal source of plants which come from certified seed. Several tests have failed to indicate that bacterial canker overwinters in our field soils here, although planting tomatoes in a field where the disease occurred the previous year is discouraged. The major problem here is to clean up small farms where the use of home-grown infected seed and infested plant beds perpetuates the disease on an individual farm or in a local community. (C. M. Haenseler)

NEW YORK: One canning company imported from another State enough tomato plants to set 500 acres. Unfortunately they were infected with bacterial canker. A conservative estimate of the loss was $50 an acre or $25,000. Other companies imported a few plants from the same source. These together with some infection where rotations were not practiced brings the total loss in the State to approximately $30,000. It has been found that hot water seed treatment, clean seed beds, and 2-year rotations completely control the disease. It rarely is present any more in commercial fields. (Charles Chupp)

PENNSYLVANIA: Very few fields of tomatoes had even a trace of bacterial canker. Control -- Seed fermentation and hot water seed treatment combined with seed bed spraying and field rotation have almost completely driven the disease from the State. (R. S. Kirby)

WEST VIRGINIA: None observed. (J. G. Leach)

TOMATO BACTERIAL SPECK (Bacterium tomato)

NEW YORK: Specimens were sent to the Department from Chautauqua County. Our bacteriologist made the determination. The organism is Phytomonas tomato (Okabe) Magrou (syn. Bacterium punctulans Bryan). Apparently there was no appreciable loss. (Charles Chupp)

TOMATO LATE BLIGHT (Phytophthora infestans)

DELAWARE: Late blight was serious on tomatoes in New Castle County only and in a few plantings only. Plantings affected usually were in close

proximity to diseased potatoes. Average loss for the State was of no consequence. (S. L. Hopperstead)

MARYLAND: Phytophthora infestans was not observed on tomato foliage this year although potatoes were severely affected. There was an estimated 10% loss from fruit rots, chiefly buckeye rot caused by a species of Phytophthora, presumably P. terrestris [parasitica]. This disease was about as destructive on staked tomatoes in home gardens as on field-grown tomatoes. The unusually heavy rains apparently splashed the fungus from the soil to fruits rather high up on the vines. Buckeye rot is of little importance in the State in the ordinary season. (C. E. Cox)

NEW JERSEY: Never general and usually severe in only a very few fields. No increase observed in 1942. (C. M. Haenseler)

NEW YORK: Dr. Reddick states that tomatoes at the beginning of the late blight season are almost immune to the fungus as it appears on potatoes. One leaf only in an entire field of tomatoes may be attacked. The fungus, gaining virulence from this slight infection, attacks more foliage the second generation. The virulence then increases for at least 7 generations of the pathogen, after which it can attack tomatoes in epidemic form. That is what happened this season. The potato blight started early, and since the 7 generations of the fungus can occur in 35 days if the weather is favorable, it had ample time to build up its powers of infection. Until frost time it swept tomato fields almost as readily as it attacked potatoes. (Charles Chupp)

PENNSYLVANIA: Late blight for the first time in many years was observed in all sections of the State. In most areas infected fields were scattered, but in the northeastern part over 80% of the fields were infected. The disease was most destructive on tomatoes growing in the vicinity of blighted potato fields. In the southern part of the State it was usually found only in fields that were planted very late. The average State loss was 3% and the disease was first observed July 18. Control -- Spraying with 6-6-100 Bordeaux is an effective preventative measure. (R. S. Kirby, C. S. Cannon, G. L. Zundel, and A. H. Bauer)

WEST VIRGINIA: Late blight was present on tomatoes and caused some injury. There was also a great deal of rot caused by another species of Phytophthora, probably Phytophthora terrestris [parasitica]. No spraying experiments were conducted to determine the effectiveness of spraying. The greatest amount of loss occurred in fields where the tomato plants were not staked, the fruit coming in close contact with the soil. The disease, however, was not confined to unstaked plants for some fields with staked plants were observed with heavy losses. (J. G. Leach)

TOMATO MOSAICS AND SPOTTED WILT (Virus)

MARYLAND: Virus diseases were not more prevalent than usual this year. The shoe-string type of Mosaic was abundant in home gardens, especially in the Baltimore area. A small amount of tobacco mosaic type virus

could be found in almost all tomato fields visited throughout the State. A virus disease not previously observed in this State was found in 3 tomato fields in western Maryland. Less than 1% of the plants were affected. The symptoms were identical with those of tip-blight. The plants in each of the 3 fields were traced to a particular shipment of plants from a southern State. The disease was not found in nearby fields set with plants from other shipments from the same State, nor was it observed in fields set with southern plants in other localities in Maryland. (C. E. Cox and Mark W. Woods)

NEW JERSEY: Mild mosaic is general throughout the State late in the season but does not appear to cause serious trouble if the crop is liberally fed. Yellow tobacco mosaic was of minor importance this year although in other years a field here and there may have 50 to 90% infected plants. The shoestring or fernleaf virus disease caused much more trouble than usual. It was very general in small garden plantings and caused very heavy losses in a few commercial fields. Little or no damage occurred in commercial plantings of large-fruited varieties but practically 100% infection was observed in one 5-acre planting of a plum tomato. Other fields of pear and plum types also showed abundance of the shoestring disease whereas adjacent plantings of large-fruited types (Marglobe and Rutgers) showed no infection. Until this year there was no economic reason to think of probable control measures but our experience in 1942 emphasized the potential importance of this disease. (C. M. Haenseler)

NEW YORK: The shoestring type of mosaic appeared in epidemic form in 1942. Hardly a garden planting escaped the virus, and some large fields showed as much as 35% of infected plants. One plant grower who sold more than 2 million plants unfortunately introduced the virus into his seed beds. He grew petunias in part of his range of greenhouses. The women employees apparently transmitted the virus from the petunia beds to the tomatoes. Petunias are one of the chief sources of inoculum. In New York State spotted wilt occurs on tomatoes only when they are inoculated in the seed bed by infected flower hosts growing near them. California Wonder pepper, however, becomes generally infected during certain seasons. The disease appears on them almost simultaneously throughout the entire State, usually some time in September. Apparently the erratic appearance of the disease is due to the prevailing temperatures. For instance, in March a group of greenhouses planted to tomatoes showed spotted wilt in such a serious condition that the entire crop seemed doomed. In early May the plants had almost fully recovered. During the cool weather the virus thrived, but as soon as the sun shone through the glass and the temperatures became abnormally high, the virus either died or became inactive. In the same way peppers must become infected in late summer, but show no symptoms until there is a week of cool weather, when the symptoms appear almost universally. (Charles Chupp)

PENNSYLVANIA: Mild or tobacco mosaic was general throughout the State. It was severe in some sources of home-grown plants, and in southern-grown plants. No severe outbreaks occurred. Shoestring or cucumber mosaic was very prevalent in home gardens in western Pennsylvania and some occurred in

the northeastern and central parts of the State. Spotted wilt occurred in one county in the western and one in the northeastern part. The average State loss was 1.5%. Control -- The mosaics in most cases were traceable to failure to eradicate other host plants in the seed bed area or to the use of tobacco by those handling plants. (R. S. Kirby, C. S. Cannon, and A. H. Bauer)

WEST VIRGINIA: Virus diseases were present although apparently not more abundant than in normal years. There was considerable loss in the vicinity of Morgantown caused by tipblight, a variety of spotted wilt. The source of infection in all cases was plants grown in one commercial greenhouse that was badly infected with the disease. The disease was not observed elsewhere in the State. (J. G. Leach)

TOMATO SEPTORIA LEAFSPOT (Septoria lycopersici)

DELAWARE: Septoria leafspot was in evidence as light infection early in the season but did not reach serious proportions until the latter part. Control by dusting or spraying was effective when applications were applied with sufficient frequency. Crowded plantings or those with poor air drainage showed less value from spraying or dusting than other plantings. (S. L. Hopperstead)

MARYLAND: Septoria leafspot is never as important as alternaria leafspot in this State. This year it was less prevalent than usual. Although it could be found rather generally in the latter part of the season the loss caused by this disease was probably negligible. (C. E. Cox)

NEW JERSEY: Very prevalent during late August and September and associated with Alternaria and Stemphylium, caused almost total defoliation in many fields by the time half the crop was harvested. Only few fields observed where Septoria was the sole blighting organism. Others showed Septoria and Alternaria, or Septoria, Alternaria, and Stemphylium on the same plants, giving a blight complex. Sprays gave only partial and inadequate control of this blight complex. (C. M. Haenseler)

NEW YORK: Where crop rotations and hot water seed treatment have been practiced, Septoria blight has been almost entirely eradicated. The only areas where it still is present are in counties where crop rotations are not practiced or in a very limited area where horse-nettle is prevalent. This weed apparently is the only outside source for inoculum. (Charles Chupp)

PENNSYLVANIA: Septoria leafspot was present throughout the State and was first observed May 27. The disease caused an average state loss of 10%. It was very destructive in the southeast, and above average in all other parts of the State. For the first time in many years Septoria was more destructive than Alternaria in southeastern Pennsylvania. Control -- Hot water seed treatment, seed bed spraying, and 3-year rotation checked the disease early in the season but excess rainfall allowed the pathogen to become destructive late in the season, in many sections of the State.

Wide spacing of plants in the field tends to check the disease. (R. S. Kirby, C. S. Cannon, C. D. Burke, A. H. Bauer, and G. L. Zundel)

WEST VIRGINIA: Septoria leafspot was more prevalent than usual in West Virginia. This can be explained partly by the heavy and frequent rainfall. In spite of conditions favorable to the development of Septoria leaf blight this disease was not as prevalent as Alternaria leafspot. In most cases the disease made its appearance late in the season and greatest damage was done in late summer. (J. G. Leach)